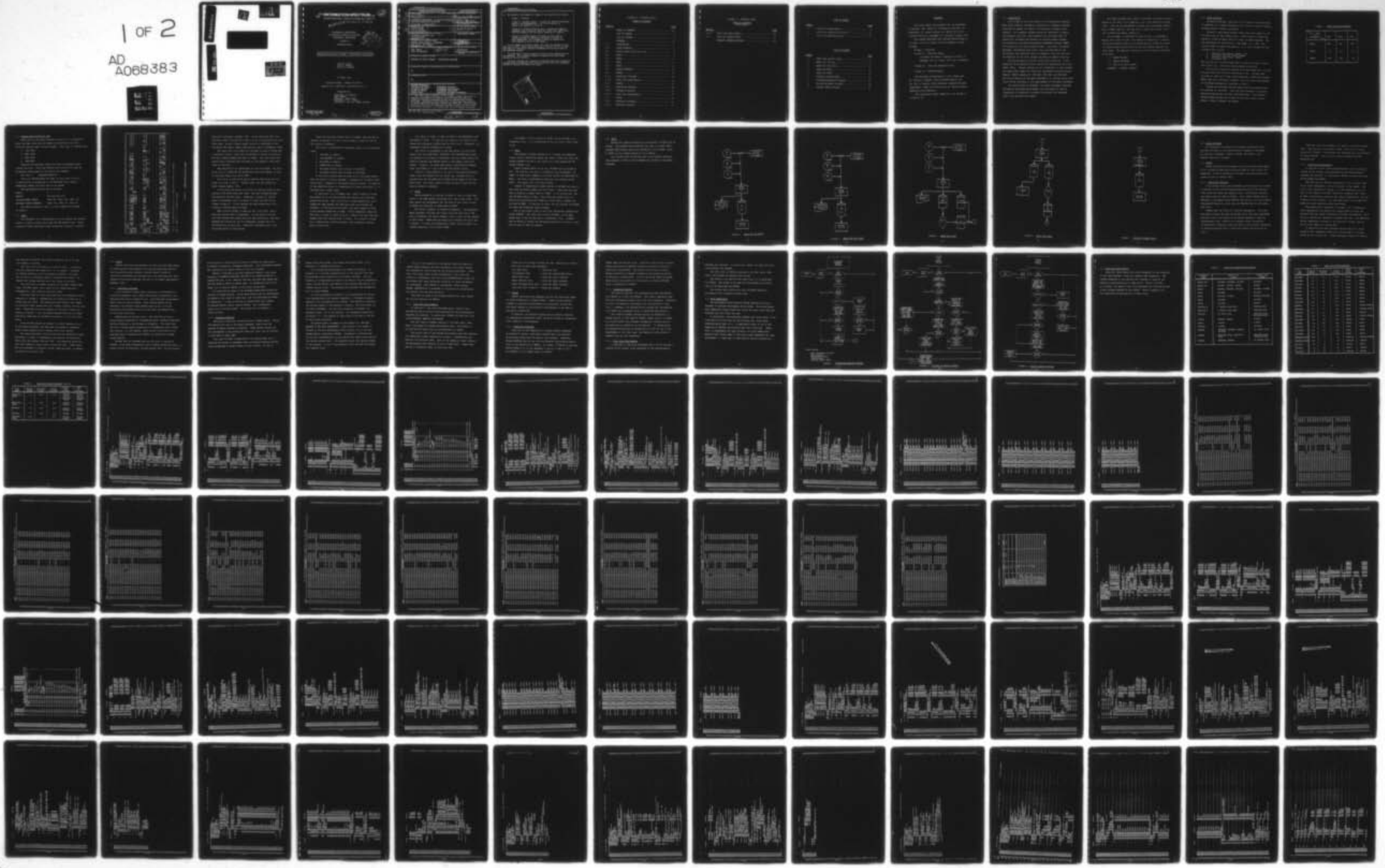
AD-A068 383 INFORMATION SPECTRUM INC WARMINSTER PA F/G 1/3
MAINTENANCE IMPROVEMENT: AN ANALYSIS APPROACH INCLUDING INFEREN--ETC(U)
MAR 79 M CLYMAN, V A GENTILE, P S GRENETZ MDA903-78-C-0176
UNCLASSIFIED ISI-W-7958-02D NL

1 OF 2

AD A068383



INFORMATION SPECTRUM, INC.

1040 KINGS HIGHWAY NORTH • CHERRY HILL, NEW JERSEY 08034 • (609) 667-6161

2

AD 68382 ISI Report No. W-7958-02D

MAINTENANCE IMPROVEMENT:
AN ANALYSIS APPROACH INCLUDING INFERENTIAL TECHNIQUES

VOLUME IV

SOFTWARE MANUAL

Approved for public release: distribution unlimited.

Milton Clyman
Vito A. Gentile
Philip S. Grenetz

15 March 1979

Contract Number: MDA903-78-C-0176

(Section E-1, Item 0002, and Section F-2, C.)

Prepared for:

Department of Defense
OASD (MRA&L)
Pentagon - Room 2B323
Washington, D.C. 20301
Attention: Lt. Col. Roger Grossel

1745 JEFFERSON DAVIS HIGHWAY
ARLINGTON, VIRGINIA 22202
(703) 521-1050

955 LOUIS DRIVE
WARMINSTER, PA. 18974
(215) 674-8022

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

(14) 1. REPORT NUMBER
ISI-W-7958-Ø2D

2. GOVT ACCESSION NO.

(9) 3. RECIPIENT'S CATALOG NUMBER

(15)

(6) 4. TITLE (and Subtitle)
MAINTENANCE IMPROVEMENT: AN ANALYSIS APPROACH INCLUDING INFERENTIAL TECHNIQUES.
VOLUME IV. SOFTWARE MANUAL.

5. TYPE OF REPORT & PERIOD COVERED
FINAL rept.
27 DEC 1977 - MAR 1979

6. PERFORMING ORG. REPORT NUMBER
ISI W-7958-02D

(10) 7. AUTHOR(s)
MILTON/CLYMAN,
VITO A./GENTILE
PHILIP S./GRENETZ

(15) 8. CONTRACT OR GRANT NUMBER(s)
MDA 903-78-C-Ø176

9. PERFORMING ORGANIZATION NAME AND ADDRESS
INFORMATION SPECTRUM, INC.
955 LOUIS DRIVE
WARMINSTER, PA 18974

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS
DEFENSE SUPPLY SERVICE - WASHINGTON
ROOM 1D-245, THE PENTAGON
WASHINGTON, D.C. 20301

(11) 12. REPORT DATE
15 MARCH 1979

13. NUMBER OF PAGES
163

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)
OASD (MRA&L)
2B323 THE PENTAGON

(12) 165p.

15. SECURITY CLASS. (of this report)
UNCLASSIFIED

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

N/A

18. SUPPLEMENTARY NOTES

N/A

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

AIRCRAFT MAINTENANCE	
COST/DOWN-TIME IMPACT	MAINTENANCE EFFICIENCY
NO REPAIRS REQUIRED	MAINTENANCE EFFECTIVENESS
FAILURE TO REPAIR	MAINTENANCE IMPROVEMENT
INDUCED DEFECT	POTENTIALLY AVOIDABLE MAINTENANCE

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This final report, contained in four volumes, presents the results of research into assessing the economic (cost and down-time) impact of Potentially Avoidable Maintenance actions for selected Naval aircraft subsystems. Maintenance actions requiring no repair and those resulting in induced defects and failure-to-correct were identified. Specific high-driver two-digit Work Unit Codes were analyzed for the F-14A Fire Control, S-3A Bombing Navigation, S-3A Landing Gear, and A-7E Bombing Navigation.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

411 160 LB

20. The content of the respective volumes of this report are as follows:

Volume I - Overview

Volume II - Technical Report - includes the research methodology, results, and recommendations. The Interim Feasibility Report is an appendix to Volume II.

Volume III - Detailed Technical Data - includes the computer-generated input information tables and output data tables which form the foundation for the results contained in Volume II.

Volume IV - Software Manual - includes the logic used to develop software for generating the tables in Volume III, user instructions, and a complete listing of programs that were executed to arrive at the tables.

For the respective aircraft studied, only data from squadrons within CNAL were utilized. These results were used to project the cost and down-time impact of Potentially Avoidable Maintenance for the whole fleet of the subsystems studied.

The study made a coarse evaluation of Built-In Test effectiveness for one subsystem. Fault isolation capability regarding Shop Replaceable Assemblies was also assessed.

The study concluded that Potentially Avoidable Maintenance contributes significantly to maintenance costs and aircraft down-time, and recommends actions to identify and control the causes.

VOLUME IV - SOFTWARE MANUAL

TABLE OF CONTENTS

Section		Page
	TABLE OF CONTENTS	iii
	LIST OF TABLES	v
	LIST OF FIGURES	v
	FOREWORD	vi
1.0	INTRODUCTION	1
2.0	MERGE PROGRAMS	3
2.1	Loading Tape Files Onto Disk	5
2.2	MRG2A	5
2.3	MRG2B	9
2.4	MRG2C	10
2.5	MRG2D	11
3.0	SEARCH PROGRAMS	17
3.1	PROG3A	17
3.1.1	Subsidiary Programs	17
3.1.2	Input Data Requirements	18
3.2	PROG3B	20
3.2.1	Subsidiary Programs	20
3.2.2	Checkpoint/Restart	21
3.2.3	Input Data Requirements	23
3.3	PROG3C	24
3.3.1	Subsidiary Programs	24
3.3.2	Checkpoint/Restart	25

VOLUME IV - SOFTWARE MANUAL

TABLE OF CONTENTS
(Continued)

Section		Page
3.3.3	Input Data Requirements	25
4.0	DISK FILE INPUT/OUTPUT	30
	APPENDIX PROGRAM LISTINGS	A-1

LIST OF TABLES

Number		Page
1	Input File Requirements	4
2	Disk File Creation/Utilization	31
3	Disk Files Specifications	32

LIST OF FIGURES

Number		Page
1	AMPAS Tape Record Layout	6
2	MRG2A For JB Files	12
3	MRG2A For JBW Files	13
4	MRG2B And SORT1	14
5	MRG2C And SORT2	15
6	Indexing Program MRG2D	16
7	No-Repairs-Required Program	27
8	Failure-To-Repair Program	28
9	Induced Defect Program	29

FOREWORD

This Final Report was prepared for the Department of Defense, OASD (MRA&L) by Information Spectrum, Inc., Warminster, PA, under Contract No. MDA903-78-C-0176. (Contract Period 27 December 1977 through 15 March 1979.)

This report describes work covered during Phase II (17 April 1978 to 15 March 1979 and consists of four volumes:

Volume I - Overview

Volume II - Technical Report

including the Phase I Feasibility Study (27 December 1977 to 7 April 1978) as an Appendix

Volume III - Detailed Supporting Data

Volume IV - Software Manual

The principal contributors to this volume were Mr. Philip S. Grenetz, Senior Systems Analyst and Mr. Vito A. Gentile, Vice President (Computer Systems Department); under the direction of Mr. Milton Clyman, Executive Vice President.

The contractors report number for this volume is W-7958-02 (D).

1.0 INTRODUCTION

This Volume of the Final Report on the Maintenance Improvement Study presents information regarding the computer programs developed to assess the impact of Potentially Avoidable Maintenance. This computer program system was developed to assess the frequency and cost (both monetary cost and down time) of Potentially Avoidable Maintenance of airborne weapon systems. The Potentially Avoidable Maintenance Assessment System (PAMAS) is divided into two main program groups. One group, the merge programs, pre-process data files, which are provided by the San Antonio Data Services Center on magnetic tape with the help of personnel at the Naval Weapons Engineering Support Activity.

The pre-processing involves three basic functions. First, selection of maintenance action records for appropriate Work Unit Codes (WUCs). Second, merging of the information on three different tapes—data tapes for Analytical Maintenance Program Analysis Support (AMPAS) Reports No. PTX-438D, PTX-438E, and PTX-438P. The third function of the merge programs is to provide output disk files sorted according to the requirements of the search programs.

The second group of programs, the search programs, performs the search algorithms which detect the occurrence of various categories of Potentially Avoidable Maintenance and assesses their cost and down-time impact.

The PAMAS programs were coded in the COBOL language and implemented on the IBM 370-115 computer, with a Disk Operating System (DOS). They can be implemented on almost any high-speed computer with a COBOL compiler, one tape drive, three disk drives, and a 198 kiloword core memory capability.

This document is designed to serve as both a programmer's manual and a user's guide. The former by explaining, in detail, the data processing flow of the system and the latter by providing step-by-step instructions for use and formats required for input data. The remaining sections of this Volume are organized as follows:

2.0 MERGE PROGRAMS

3.0 SEARCH PROGRAMS

4.0 DISK FILE INPUT/OUTPUT

APPENDIX - PROGRAM LISTINGS

2.0 MERGE PROGRAMS

The merge programs, described in this section, were designed to generate four indexed sequential disk files for input to search programs PROG3A, PORG3B, and PROG3C.

Basically, each merge program reads three data tapes for one aircraft—one for each AMPAS report. Each aircraft's tapes are sorted in three different ways for input to these programs. The sort sequences are identified by code names, e.g., JBW. The initials used in these code names—J, B, S, and W—stand for the following sort fields:

J	ten-digit Job Control Number (JCN)
B	six-digit Aircraft Bureau Number
S	ten-digit part Serial Number
W	five-digit WUC

The initials are in order—from left to right—of minor to major sort field, e.g., JCN within Bureau Number within WUC.

Two slightly different versions of program MRG2A are utilized for both JB-sorted files and JBW-sorted files. Program MRG2C utilizes as input only those files generated by MRG2B and program MRG2D uses only the output of MRG2C. The file input requirements of the merge programs are indicated in Table 1.

Records are selected from the tape files to eliminate WUCs not relevant to the study. They are also screened to eliminate duplicate records and obviously erroneous data. The selected/merged/sorted records are written to four disk output files—MSTRJB, MSTRJBW, MSTRJSW, AND MSTRJW.

TABLE 1. INPUT FILE REQUIREMENTS

TAPE PROGRAM	438D	438E	438P
MRG2A	JBW	JBW	JBW
MRG2A	JB	JB	JB
MRG2B	JSW	JSW	JB

2.1 Loading Tape Files Onto Disk

Before any of the merge programs can be run on a production basis the tape files must be loaded as sequential disk files which are used as input to the programs. Each tape is labelled with:

A. VOL1 label

B. HDR1 label

C. HDR2 label

D. TAPE MARK

These are non-standard labels and must be bypassed before loading the file. Using the IBM/DOS Ditto routine the tape can be properly positioned for the load by the command:

```
FSF, xxx, 1      (xxx=TAPE DRIVE NO.)
```

This will forward-space the tape, on drive xxx, one file. An End-Of-File is recognized at the TAPE MARK which appears immediately before the valid data to be loaded.

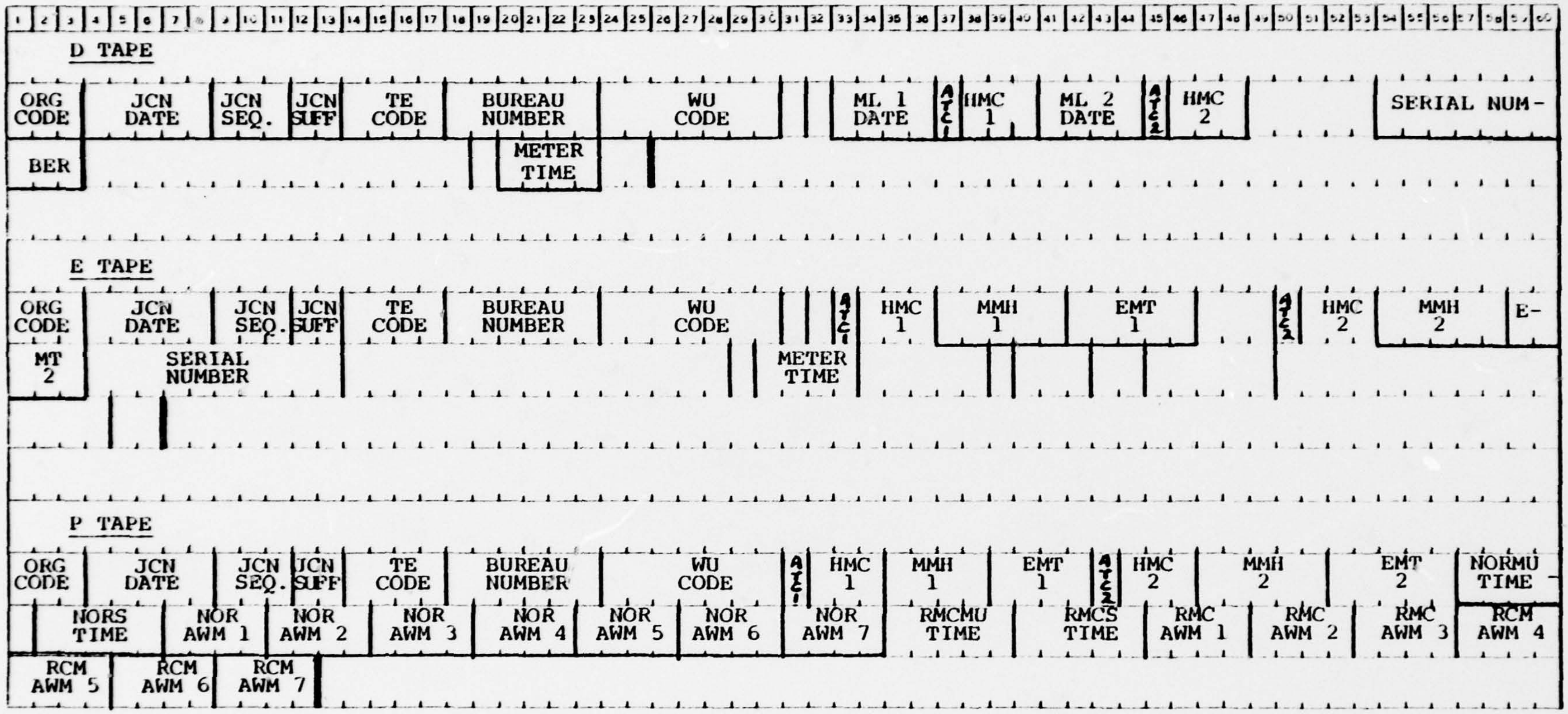
The tape specifications are as follows:

TRACKS	9
DENSITY	800 Bits Per Inch
LOGICAL RECORD LENGTH	438D - 85, 438E - 126, 438P - 134
BLOCKING FACTOR (RECORDS)	438D - 141, 438E - 95, 438P - 89

The record layouts of the D, E, and P tapes are provided in Figure 1.

2.2 MRG2A

This program, with interchanging of a few control and program cards, is used to create the JB and the JBW merged files. Merge program 2A reads keypunched cards containing five-digit (external)



Note 1: The underlined fields of D, E, & P Tapes are the fields to be merged.

Note 2: AWM 1, 2, ..., 7 for NOR are summed.

FIGURE 1. AMPAS TAPE RECORD LAYOUT

WUCs and a two-digit (subject) WUC. As the cards are read, the two-digit code is stored and a table is set up containing the five-digit WUCs. Since a binary search routine is performed on the five-digit WUC table, these codes must be input in ascending order.

The input card is divided into thirteen six-digit fields with a two-digit filler. Each field is defined as having a five-digit WUC and a space between each pair of codes. Only the first card should have a two-digit WUC followed by four spaces in the first field of the card.

When End-Of-File is encountered on the card reader, the card input file is closed and the three tape files are opened, as well as the disk output file (JB or JBW).

The D-file is read first and is used as the driver for the other two files (E and P). Certain keys from the record are saved (Bureau Number, JCN).

If the first two digits of the WUC on tape are equal to the two-digit WUC saved from card input, then the program bypasses the search of the WUC table. Otherwise, a search of the WUC table is performed, and if no match is found the next D-file record is read in. D-file records are read sequentially until a match in the WUC table is found.

When a D-file record is read and has a valid WUC, then a duplicate record check is performed. If the record that was just read matches the record that was read previously, then both records are printed out and all subsequent records that are duplicates are printed also. Reads are performed until a non-duplicate record is encountered.

After the duplicate record check is passed, then the WUC is checked for spaces. If one or more spaces is found in the WUC, the record is bypassed.

The record is subjected to additional tests in the following order:

a. JCN-DATE is numeric

b. JCN-SEQUENCE is numeric

c. ML1-DATE is numeric

d. METER-TIME is numeric

e. ML1-DATE greater than or equal to JCN-DATE

f. ML2-DATE greater than or equal to ML1-DATE

If the D-file record does not pass all of the above checks, then the record is simply bypassed. Otherwise all D-record information that is needed for the merged record is saved. In addition, if the SERIAL-NO field is a combination of zeros and blanks, it is replaced with a blank field.

At this point, it is assumed that a good D-record is found and passed all of the above checks and certain keys from that record were saved. Next, the E-file is read sequentially and a comparison made between the same keys from the E-record and D-record. If the keys do not match, the next E-record is read in and another comparison is made. E-file sequential reads are done until a match is found or until a record with keys that are greater than the D-record keys is found, If no match is found, but a greater-than situation exists, then processing reverts back to the D-file.

If a match is found, a check is made on the MMH-LEVEL-1 and MMH-LEVEL-2 fields. If they are not numeric, the record is bypassed and processing reverts back to the D-file. Otherwise, all necessary E-record information is saved.

The P-file is processed in the same manner as the E-file, except that the NORMU-TIME, NORS-TIME, and NOR-AWM-TIME fields are tested for non-numeric characters, and only these fields are saved to complete the merged record if the numeric tests are passed. Actually, the seven AWM fields (distributed by Reason Code) are summed to a total NOR-AWM-TIME before saving.

After all three records (D, E, and P) have been selectively saved, they are merged into one record and a decade digit is affixed onto the ML1-DATE and ML2-DATE fields based on the JCN-DATE field. The output record is then written to disk and the entire process is repeated.

2.3 MRG2B

Merge program 2B is similar to MRG2A in that it reads card input in the same manner and merges the D and E tape files. The data checks and adjustments that are made on the D and E files by MRG2B are identical to those made by MRG2A.

The P-file, however, is treated differently. The remaining merge programs (including 2B) result from the fact that a JSW sort is required, but Serial Number is not a field in the records of the P-tape. MRG2B does not merge the P-record with the D and E records. It saves the appropriate fields, writing them to an indexed sequential file called P-TEMP.

The merged D/E file output by MRG2B, called DE-TEMP, is a sequential file. It is JSW-sorted as are the input D and E tape files.

2.4 MRG2C

The purpose of merge program 2C is to merge the temporary output files of MRG2B and create two output files—the final JSW-sorted indexed file and a file which will later become the JW-sorted indexed file.

Before program MRG2C can be run, DE-TEMP must be sorted by JSW. The need for this sort is created by the replacement, by MRG2B, of some Serial Numbers with blank fields, as described for MRG2A. The sort is performed by executing the program called SORT1. The output file is called DE-SORT.

Program 2C sequentially reads records of DE-TEMP and sets up keys from the Bureau Number and JCN fields. These keys are then used to perform a random read of P-TEMP. On an invalid key, the next DE-TEMP record is read. This condition occurs only if a record was eliminated from P-TEMP by a data check in MRG2B, but not from DE-TEMP. If the key is valid, the two records are merged to create two different output records.

One of the output files is the final JSW-sorted indexed file called MSTRJSW. The other file, called JW-TEMP, is the same except that it has JW keys and is a sequential file. JW-TEMP must be sorted to obtain the JW-sorted sequential file and it must have JW keys to then be indexed.

2.5 MRG2D

Before the indexing program can be executed, JW-TEMP must be sorted. The program which performs this sort is called SORT2. Program MRG2D simply copies the sequential file JW-SORT, output by SORT2 to the indexed sequential file MSTRJW.

The figures which follow are data flow diagrams depicting the interplay of data files processed and created by the merge programs.

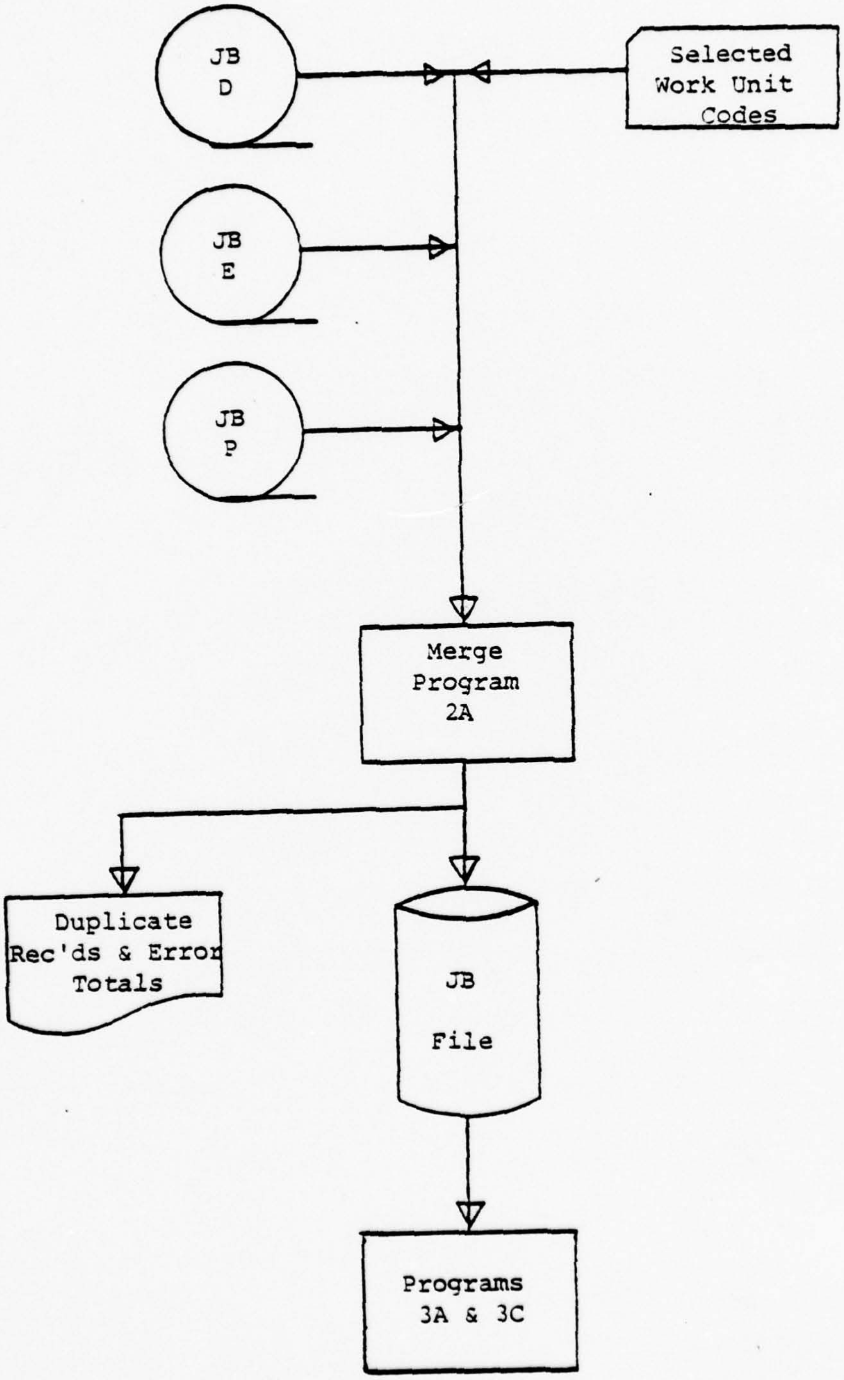


FIGURE 2. MRG2A FOR JB FILES

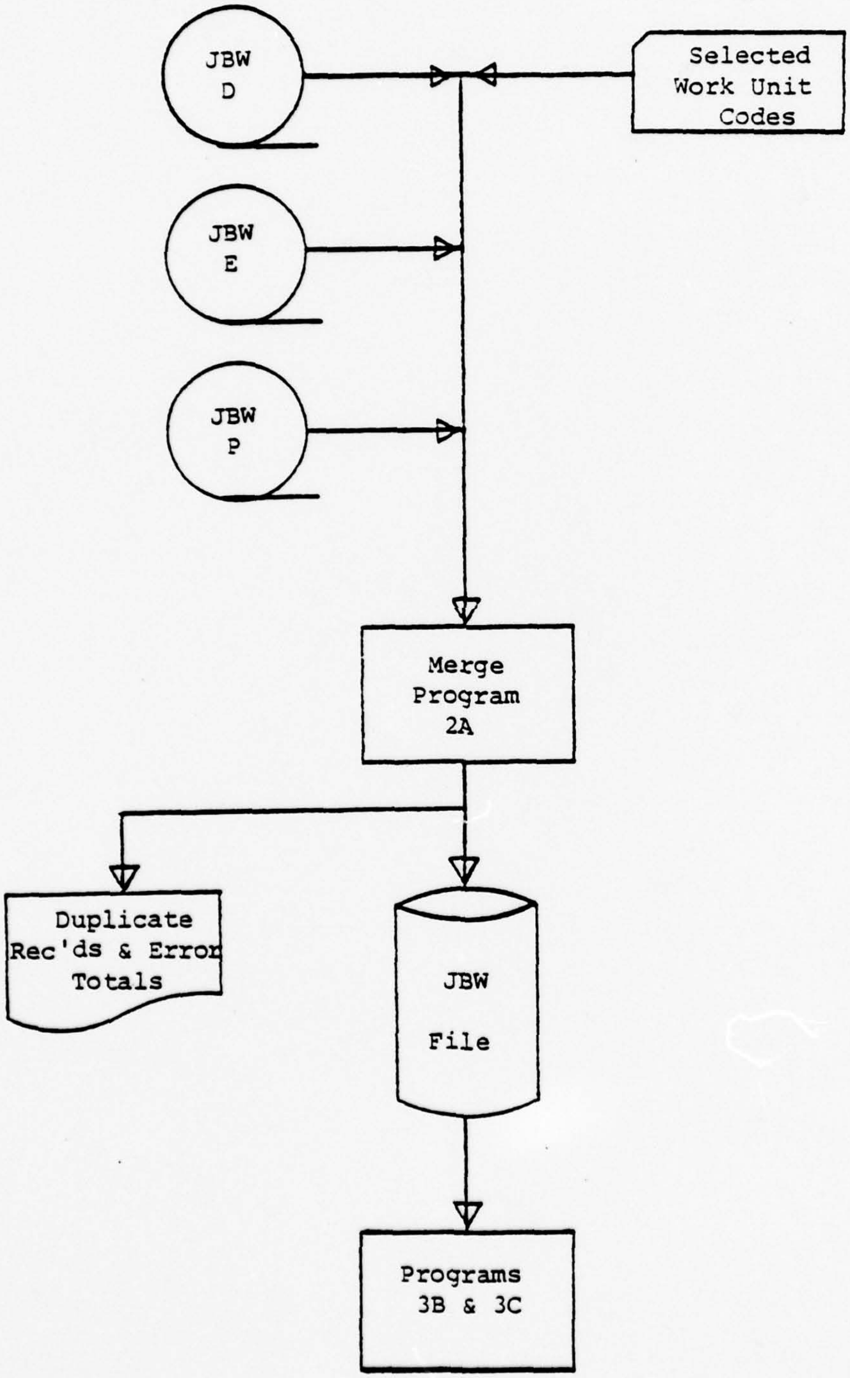


FIGURE 3. MRG2A FOR JBW FILES

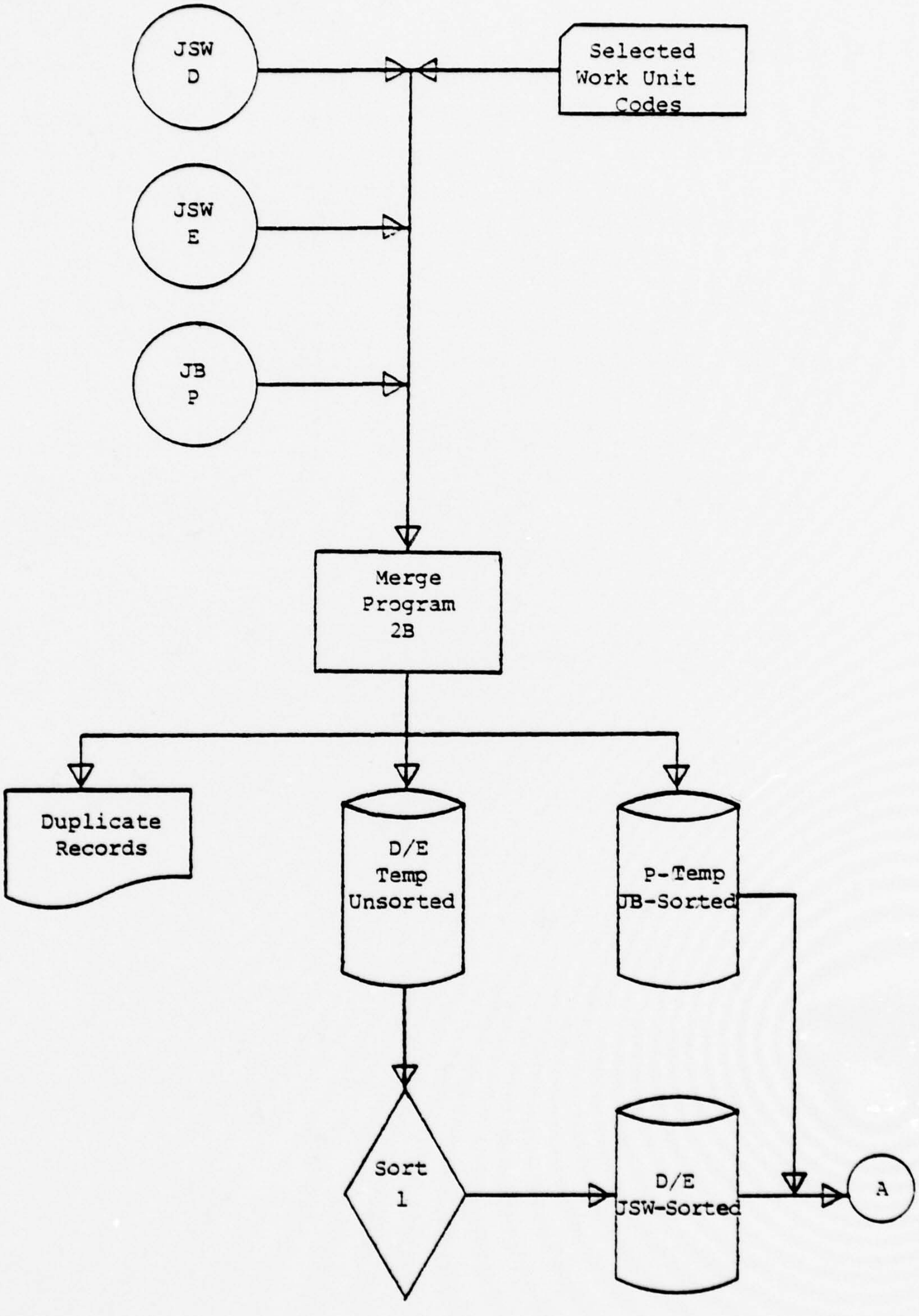


FIGURE 4. MRG2B AND SORT1

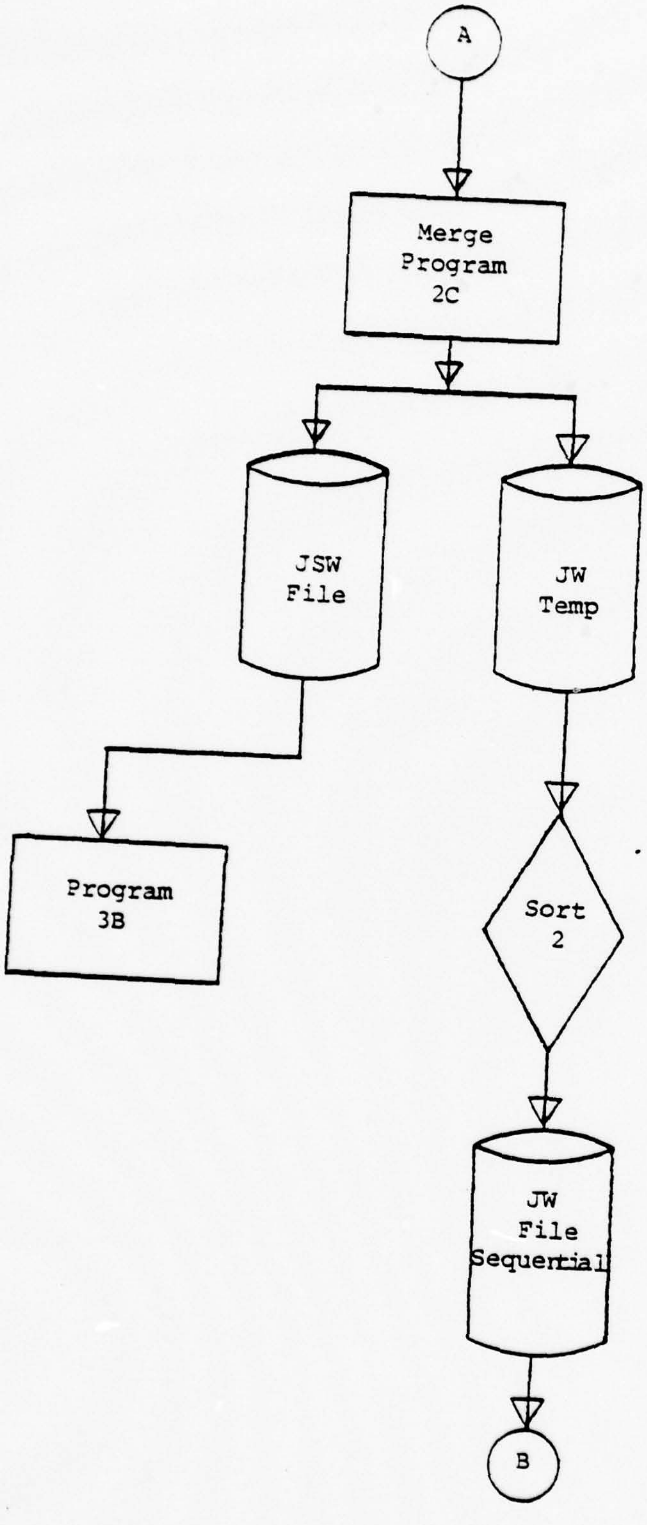


FIGURE 5. MRG2C AND SORT2

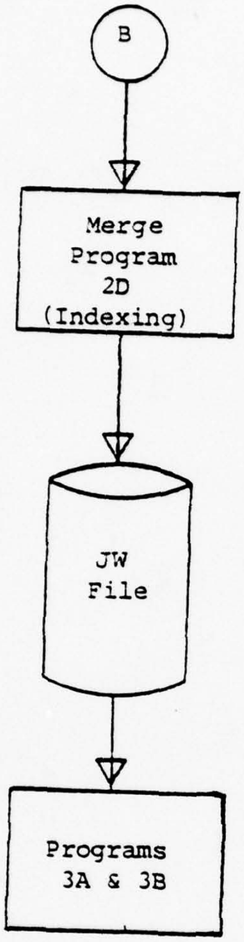


FIGURE 6. INDEXING PROGRAM MRG2D

3.0 SEARCH PROGRAMS

The detection of Potentially Avoidable Maintenance from the data provided by the pre-processing programs is performed by three main programs - PROG3A, PROG3B, and PROG3C - and several subsidiary programs.

3.1 PROG3A

PROG3A identifies and assesses the cost and down-time impact of all No-Repairs-Required actions and some of their costly consequences, including potentially avoidable cannibalizations and access actions on subject WUCs.

3.1.1 Subsidiary Programs

Since access actions are performed on WUCs physically related to the WUC on which the No-Repairs-Required action has occurred (the latter WUC being the causative one), the Physical Relationship Matrix must be used by PROG3A. Thus, before PROG3A can be executed, the program called MATFILE must be run, with the Physical Relationship Matrix as input data and PMATRIX-FILE as the output disk file.

PROG3A uses two files for internal bookkeeping. The files are used to retain the keys of records which have been considered once but, due to the nature of the search procedure, might be reconsidered later, resulting in unwanted double accounting. In particular, these key lists are used to avoid double accounting of cannibalizations——the T List——and access actions——the 2A List.

These key lists are indexed files used in the direct access mode. They must be initialized as empty lists prior to every execution of PROG3A. The program that performs this initialization is called KEYLIST. The files are called KEYLIST1-FILE and KEYLIST2-FILE.

3.1.2 Input Data Requirements

In addition to the files discussed above, two of the maintenance action history files generated by the pre-processing programs are required. In particular, PROG3A utilizes the files called MSTRJB and MSTRJW.

The card input to MATFILE consists of a set of cards, each one of which represents a row of the matrix to be loaded. The first field, beginning in column 1, is the three-digit row index —— the index of the PWUC (physically causative WUC) table or FWUC (functionally causative WUC) table, respectively, for the P Matrix or the F Matrix. All card data input to the PAMAS programs are right-justified within each field.

The second field, beginning in column 5, is a three-digit field representing the quantity of subject WUCs on which the causative WUC may induce Potentially Avoidable Maintenance. This value is limited to a maximum of eighteen per card. The remaining fields, beginning in column 9, are four-digit fields, each of which is the index of a subject WUC.

If there are more than eighteen subject WUCs for a given causative WUC, subsequent cards are to be punched in the same format as the initial card. These subsequent cards will contain the quantity of subject WUC indices remaining (up to 18) and that number of indices.

The last card in the deck is a trailer card. It contains the last causative WUC index and a "0" in column 7. Because an indexed sequential file is created by MATFILE, the cards must be input in ascending order to causative WUC index. The subject WUC indices need not be in any order on the card.

The card input to PROG3A consists of the SWUC (subject WUC) table, the PWUC table, and a table of O&I (Organizational & Intermediate) labor rates by four-digit SWUC.

The first card of a WUC table deck has one three-digit field, beginning in column 1, representing the quantity of WUCs to be loaded into the table. The remaining cards contain that number of five-digit WUCs, eleven per card (except, perhaps, for the last card). These WUCs are to be punched in five-digit fields, beginning in column 1, with two spaces between each pair of codes. Four-digit codes may be included by punching a "0" as the fifth digit.

Since the WUC tables are subject to binary searches in all of the search programs, the WUCs must be punched in ascending order, where numerals have a greater value than letters.

The labor rate deck's initial card has one three-digit field, beginning in column 1, representing the quantity of four-digit WUCs within the subject two-digit WUC. The remaining cards contain that number of labor rates in cents per hour. These rates are to be punched in ten-digit fields, eight per card, in ascending order of four-digit WUC.

3.2 PROG3B

PROG3B identifies and assesses the cost and down-time impact of Organizational Maintenance's Failure-To-Acknowledge defects, the Failure-To-Correct defects, Induced Defects caused by corrective maintenance on the same item, and Organizational Maintenance's Failure-To-Diagnose failures to the Weapon Replaceable Assembly level.

3.2.1 Subsidiary Programs

Since diagnostic ambiguities, resulting in occurrences of Failure-To-Diagnose, occur among functionally related WUCs (the defective WUC being a causative one), the Functional Relationship Matrix must be used by PROG3B. Thus, before PROG3B can be executed, the program called MATFILE must be run, with the Functional Relationship Matrix as input data and FMATRIX-FILE as the output disk file.

PROG3B uses two keylist files. One file—the 2A List — avoids double accounting of Intermediate-Level No-Repairs-Required actions occurring in the process of diagnosis. The other—the 2BC List —avoids double accounting of Intermediate Level corrective actions. As with PROG3A, these keylist files must be initialized prior to execution of PROG3B, by running the program called KEYLIST.

Another pair of programs must be run prior to executing PROG3B. Since some Intermediate Level No-Repairs-Required result in access actions on physically related subject WUCs, the occurrences of such pairs of events must be stored by PROG3A for application by PROG3B to diagnostic No-Repairs-Required. This eliminates unnecessary duplication of search effort by the two programs.

PROG3B is designed to quickly determine whether a particular diagnostic No-Repairs-Required resulted in an access action on a subject WUC and, if so, identify the cost and down-time impact and the WUC index to which to assign them. To accomplish this, an indexed file is used by PROG3B in the direct access mode.

The keys must be those of the No-Repairs-Required actions resulting in access actions. Since these actions are not encountered by PROG3A in the order of these keys, the file generated by PROG3A is sequential. It must be sorted by program SORT3 and indexed by program PROG3A1 before running PROG3B. The intermediate output file is called S-SORT. The output file of PROG3A1 is called IS-FILE.

3.2.2 Checkpoint/Restart

The keylist files are initialized with a dummy record. During the execution of any of the search programs, these files are updated by adding records as required. These update records are not encountered in any particular order and, thus, are not written in the order of their keys.

This lack of order is permitted in the update mode, but it requires the system to implement time- and space-consuming pointer chain procedures to enable access of such records. As one of these files grows larger, the access time grows longer, until eventually it becomes prohibitive.

This problem was encountered with PROG3B and PROG3C. To minimize it, a periodic reorganization of the keylist files must be performed during execution of the search program. This reordering is accomplished by copying the keylist files to sequential files — called TAPFIL1 and TAPFIL2 — the writing them back to the indexed keylist files. The program that performs this reorganization is called KEYREO.

To allow processing by PROG3B to be discontinued for keylist file reorganization and resumed thereafter, a checkpoint/restart capability was incorporated into PROG3B. When PROG3B is executed, two queries appear on the operator's console. The first query is, "IS THIS A RESTART?" For the first execution of PROG3B, the operator enters, "N" at the console. For subsequent executions he enters, "Y". The display of input data is printed at the end of the initial execution.

The second query to appear on the console is, "HOW MANY RECORDS TO THE NEXT CHECKPOINT?" This refers to the number of records in the main maintenance action history file to be processed before interrupting PROG3B. Processing is discontinued at the next incrementation of the subject WUC index after reaching the desired record count. The operator enters the desired number at the console. It is a five-character field and must be entered with leading zeros.

If all of the records for the subject WUCs have been processed before reaching the next checkpoint, the output tables are displayed on the printer and the program terminates. Otherwise, the output table values accumulated to that point are stored on a sequential disk file called RESTART-FILE, along with the subject WUC index indicating the point at which processing is interrupted. When PROG3B is re-executed, after running KEYREO, RESTART-FILE is accessed to initialize the accumulators and identify the new starting point.

Care must be taken to run program KEYLIST one time, before the initial execution of PROG3B.

3.2.3 Input Data Requirements

In addition to the files discussed above, three of the maintenance action history files generated by the pre-processing programs are required. In particular, PROG3B utilizes the files called MSTRJBW, MSTRJSW, and MSTRJW.

The card input to PROG3B consists of the SWUC table, FWUC table, and tables of average maintenance costs. The format to be used for WUC table input is as described for PROG3A.

The initial card of the average maintenance cost deck contains one three-digit field, beginning in column 1, representing the quantity of four-digit WUCs. Each of the remaining cards contains the maintenance cost factors for one of these WUCs. These cards must be in ascending order of four-digit WUC.

There are six ten-digit fields per card, beginning in column 1. From left to right they represent:

O&I Labor Rate	- cents per hour
O&I Material Cost	- cents per maintenance action
Depot Labor Cost	- cents per depot transfer
Depot Material Cost	- cents per depot transfer
Depot Transportation Cost	- cents per depot transfer
Attrition Cost (I-Level)	- cents per discard

3.3 PROG3C

PROG3C identifies and assesses the cost and down-time impact of three categories of Induced Defect. These include defects induced by corrective maintenance on a physically related WUC and those induced by non-corrective maintenance on the same or physically related WUC.

In addition, the program categorizes all defects reported, via appropriate malfunction codes, as being induced by transportation, handling, or maintenance.

3.3.1 Subsidiary Programs

Since two of the categories of induced defects addressed by program 3C involve physically related WUCs, the Physical Relationship Matrix must be used by this program. Therefore, program MATFILE must be run with the Physical Relationship Matrix prior to the execution of PROG3C. Of course, if PROG3A is executed before PROG3C — it is not necessary to do so — then it won't be necessary to run MATFIL again for PROG3C.

PROG3C uses two keylist files. One file — the PC List — avoids double accounting of defects induced by corrective action on physically related WUCs. The other — the NC List — avoids double accounting of defects induced by non-corrective action on physically related WUCs. As with the other search programs, these keylist files msut be initialized, by running KEYLIST, prior to execution of PROG3C.

3.3.2 Checkpoint/Restart

The need for keylist file reorganization was encountered with PROG3C as it was with PROG3B. The overall execution time, even with checkpoint/restart was found to be enormous. Therefore, to allow its execution unattended over long periods of time (e.g., a weekend), the reorganization program was incorporated into PROG3C as a procedure which is performed periodically.

The interval between reorganizations is determined in a manner similar to that used by PROG3B, except that it is based on a fixed record count between checkpoints, entered once at the beginning of execution by the operator. If necessitated by hardware malfunction or cancellation of the job due to the requirement to run other jobs, the capability also exists to restart from the last checkpoint.

3.3.3 Input Data Requirements

In addition to the files discussed above, two of the maintenance action history files generated by the pre-processing programs are required. In particular, PROG3C utilizes the files called MSTRJB and MSTRJBW.

The card input to PROG3C consists of the SWUC table, PWUC table, and average maintenance cost tables.

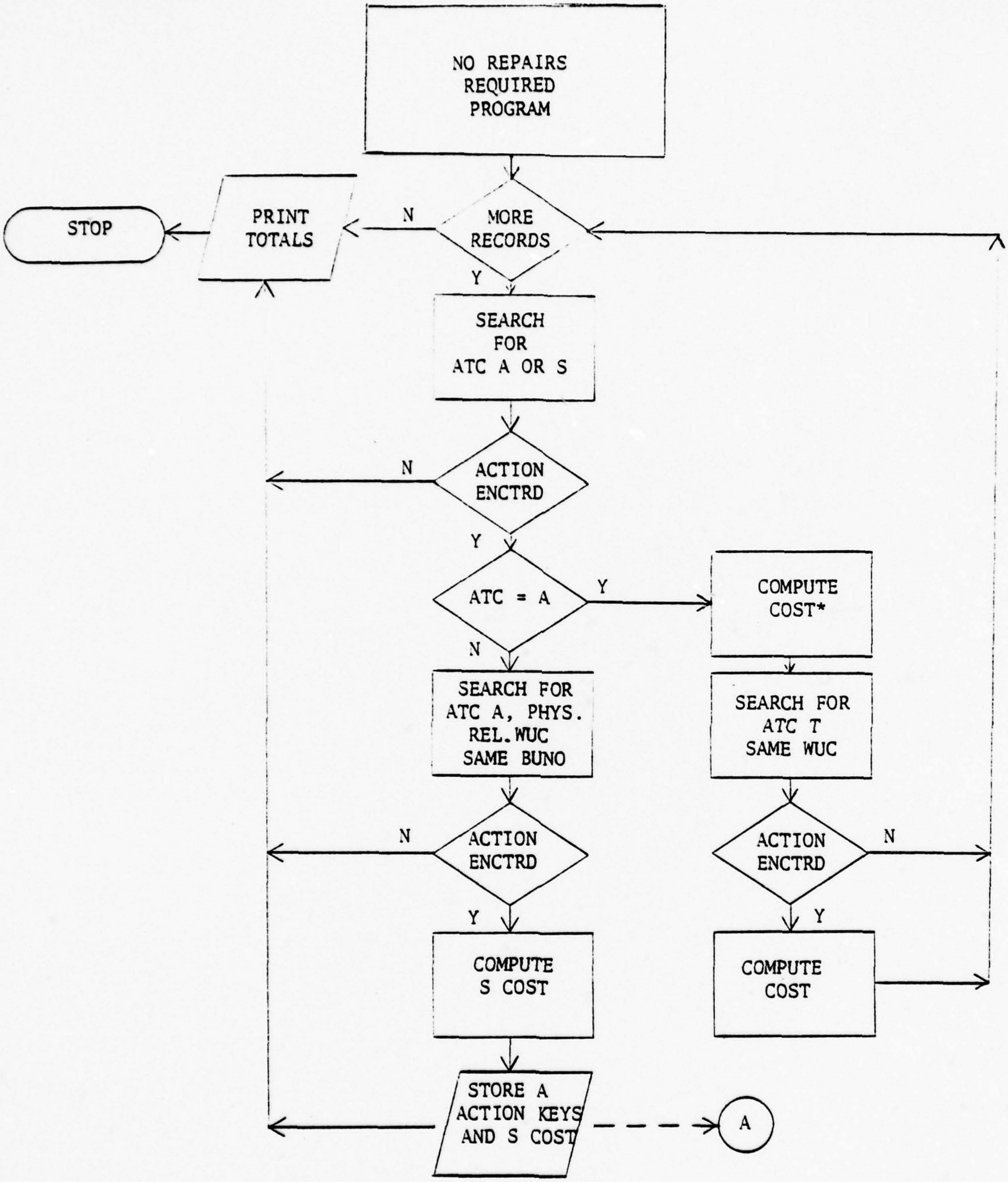
The format to be used for WUC table input is as described for PROG3A. The format to be used for maintenance cost factor input is as described for PROG3B.

The figures which follow are logic diagrams depicting the general flow of search program logic.

3.4 Date Comparisons

The Maintenance Data Reporting system employs the Julian calendar to indicate maintenance action dates. This facilitates date comparison except around the Julian new year, which does not coincide with the fiscal new year.

In particular, the difference between the Julian dates of the first day of the new year and the previous day, while being chronologically equal to 1, is numerically equal to 635 or 636, depending on whether the previous year was a leap year. Therefore, in programming the time criteria, all date comparisons spanning both Julian years of the fiscal year compensate for this discrepancy. A leap year is identified by being divisible by 4.



*Costs include:

Labor (man-hours & dollars)
Repair material
Replenishment Spares
Transportation
Downtime (NORMU & NORS)

FIGURE 7. NO-REPAIRS-REQUIRED PROGRAM

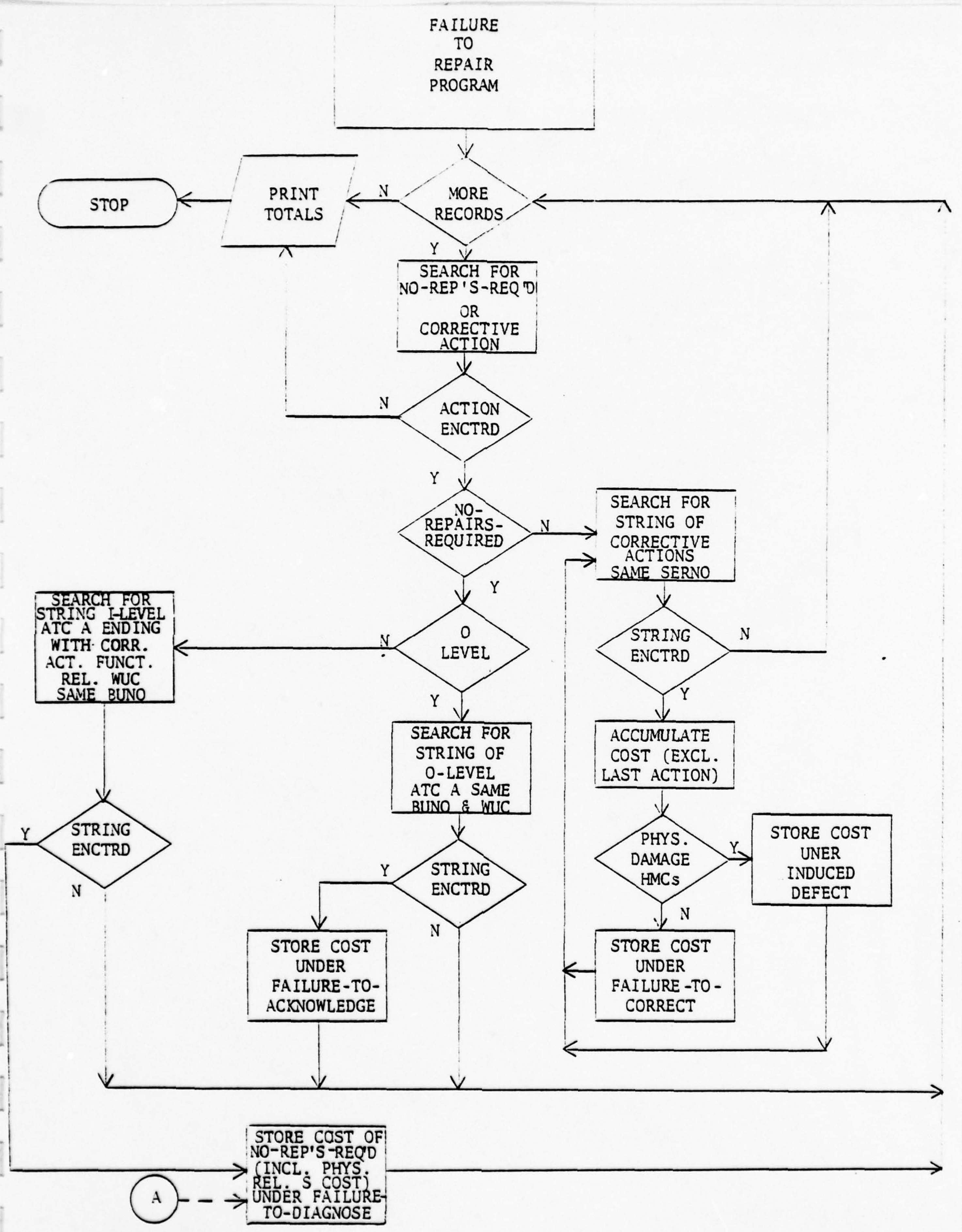

FAILURE TO REPAIR PROGRAM
STOP
PRINT TOTALS
N
MORE RECORDS
Y
SEARCH FOR NO-REP'S-REQ'D OR CORRECTIVE ACTION
N
ACTION ENCTRD
Y
NO-REPAIRS-REQUIRED
N
SEARCH FOR STRING OF CORRECTIVE ACTIONS SAME SERNO
Y
SEARCH FOR STRING I-LEVEL ATC A ENDING WITH CORR. ACT. FUNCT. REL. WUC SAME BUNO
N
O LEVEL
STRING ENCTRD
N
Y
Y
STRING ENCTRD
N
SEARCH FOR STRING OF O-LEVEL ATC A SAME BUNO & WUC
ACCUMULATE COST (EXCL. LAST ACTION)
PHYS. DAMAGE HMCs
Y
STORE COST UNER INDUCED DEFECT
N
STRING ENCTRD
Y
N
STORE COST UNDER FAILURE-TO-ACKNOWLEDGE
N
STORE COST UNDER FAILURE-TO-CORRECT
STORE COST OF NO-REP'S-REQ'D (INCL. PHYS. REL. S COST) UNDER FAILURE-TO-DIAGNOSE
A

FIGURE 8. FAILURE TO REPAIR PROGRAM

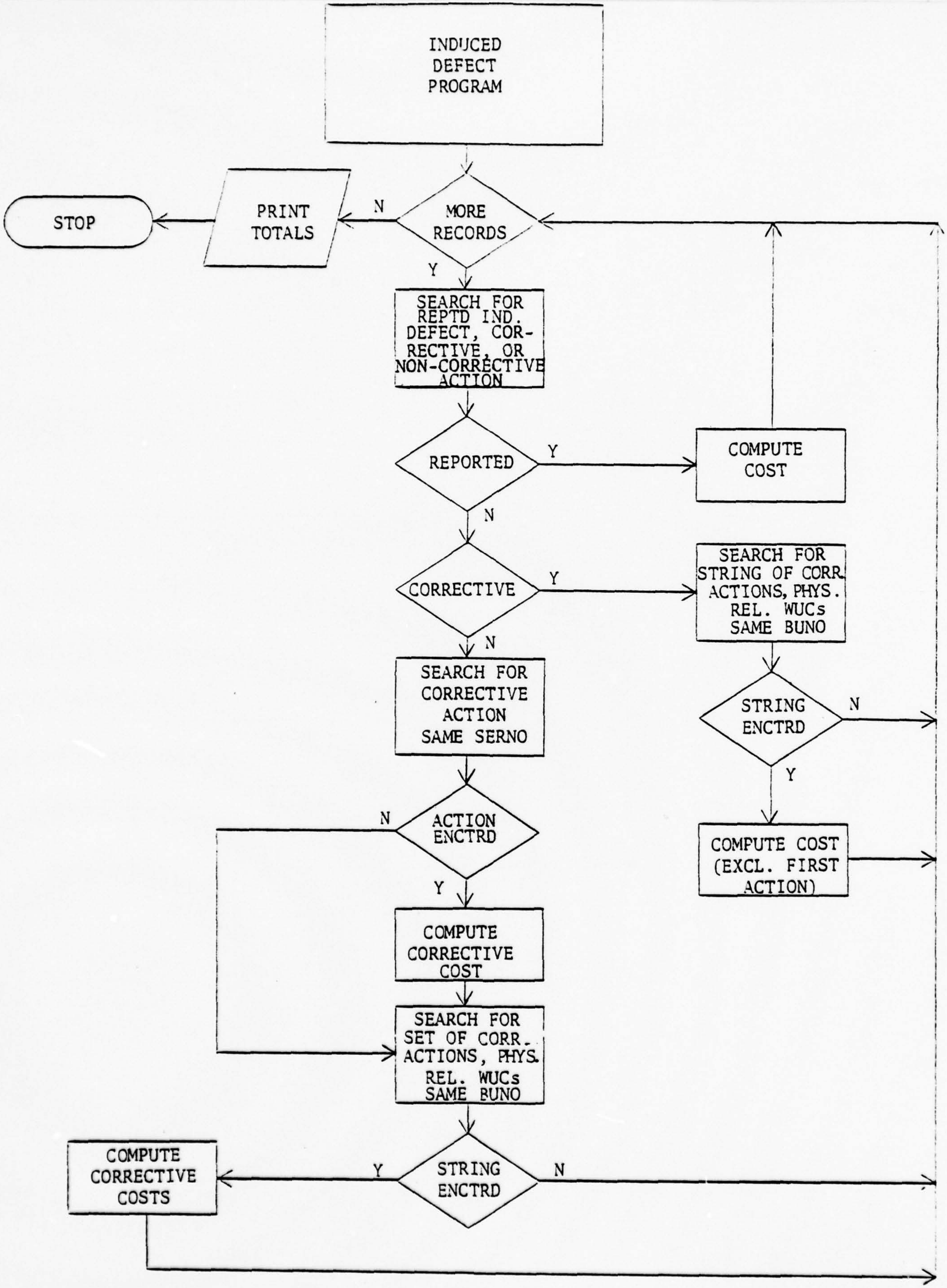

INDUCED DEFECT PROGRAM
MORE RECORDS
N
Y
PRINT TOTALS
STOP
SEARCH FOR REPTD IND. DEFECT, COR-RECTIVE, OR NON-CORRECTIVE ACTION
REPORTED
Y
N
COMPUTE COST
CORRECTIVE
Y
N
SEARCH FOR STRING OF CORR. ACTIONS, PHYS. REL. WUCs SAME BUNO
STRING ENCTRD
N
Y
COMPUTE COST (EXCL. FIRST ACTION)
SEARCH FOR CORRECTIVE ACTION SAME SERNO
ACTION ENCTRD
N
Y
COMPUTE CORRECTIVE COST
SEARCH FOR SET OF CORR. ACTIONS, PHYS. REL. WUCs SAME BUNO
STRING ENCTRD
Y
N
COMPUTE CORRECTIVE COSTS

FIGURE 9. INDUCED DEFECT PROGRAM

4.0 DISK FILE INPUT/OUTPUT

There are twenty-seven disk files necessary for the execution of the UMAS programs. Some are indexed, some sequential. The tables presented in this section are intended to identify the essential characteristics of these files. Table 2 provides, at a glance, the names of the files generated and utilized by each of the fifteen programs of the system. Table 3 augments this with quantitative descriptions of these files.

TABLE 2. DISK FILE CREATION/UTILIZATION

PROGRAM NAME	INPUT FILE NAMES	OUTPUT FILE NAMES
MRG2A(JBW)	INPJBWD, INPJBWE, INPJBWP	MSTRJBW
MRG2A(JB)	INPJBD, INPJBE, INPJBP	MSTRJB
MRG2B	INPJBP, INPJSWD, INPJSWE	DE-TEMP, P-TEMP
SORT1	DE-TEMP	DE-SORT
MRG2C	DE-SORT, P-TEMP	MSTRJSW,JW-TEMP
SORT2	JW-TEMP	JW-SORT
MRG2D	JW-SORT	MSTRJW
MATFILE(P)	P MATRIX CARD DECK	PMATRIX-FILE
MATFILE(F)	F MATRIX CARD DECK	FMATRIX-FILE
KEYLIST	NO INPUT FILE	KEYLIST1-FILE KEYLIST2-FILE
PROG3A	MSTRJB, MSTRJW	S-FILE
SORT3	S-FILE	S-SORT
PROG3A1	S-SORT	IS-FILE
PROG3B	MSTRJBW, MSTRJSW, MSTRJW, IS-FILE	NO OUTPUT FILE
KEYREO	KEYLIST1-FILE, KEYLIST2-FILE	KEYLIST1-FILE, KEYLIST2-FILE
PROG3C	MSTRJBW, MSTRJB	NO OUTPUT FILE

TABLE 3. DISK FILE SPECIFICATIONS

FILE NAME	RECORD LENGTH	BLOCKING FACTOR	TRACKS ALLOTTED	OUTPUT FROM PROGRAM	INPUT TO PROGRAMS
INPJBWD	85	90	1200	DITTO	MRG2A
INPJBWE	126	60	2100	DITTO	MRG2A
INPJBWP	134	60	1800	DITTO	MRG2A
INPJBD	85	90	1200	DITTO	MRG2A
INPJBE	126	60	2100	DITTO	MRG2A
INPJBP	134	60	1800	DITTO	MRG2A
INPJSWD	85	90	1200	DITTO	MRG2B
INPJSWE	126	60	2100	DITTO	MRG2B
MSTRJB	112	70	900	MRG2A	PROG3A, PROG3C
MSTRJBW	111	70	900	MRG2A	PROG3B, PROG3C
MSTRJSW	111	60	900	MRG2C	PROG3B
MSTRJW	112	60	900	MRG2D	PROG3A, PROG3B
DE-TEMP	80	90	900	MRG2B	SORT1
P-TEMP	35	150	900	MRG2B	MRG2C
DE-SORT	80	90	900	SORT1	MRG2C
JW-TEMP	112	60	900	MRG2C	SORT2
JW-SORT	112	60	900	SORT2	MRG2D
PMATRIX-FILE	303	1	36	MATFILE	PROG3A, PROG3C
FMATRIX-FILE	303	1	36	MATFILE	PROG3B
S-FILE	42	50	36	PROG3A	SORT3
S-SORT	42	60	36	SORT3	PROG3A1
IS-FILE	42	60	36	PROG3A1	PROG3B

TABLE 3. DISK FILE SPECIFICATIONS (Cont'd)

FILE NAME	RECORD LENGTH	BLOCKING FACTOR	TRACKS ALLOTTED	OUTPUT FROM PROGRAM	INPUT TO PROGRAMS
KEYLIST1-FILE	16	500	492	PROG3A- PROG3C KEYLIST, KEYREO	PROG3A- PROG3C KEYLIST, KEYREO
KEYLIST2-FILE	16	500	492	PROG3A- PROG3C	PROG3A- PROG3C
TAPFIL1	16	500	456	PROG3C, KEYREO	PROG3C KEYREO
TAPFIL2	16	500	456	KEYREO	KEYREO
RESTART-FILE	190	1	120	PROG3B, PROG3C	PROG3B, PROG3C

```
CBL SXREF,STATE,QUOTE,CLIST,FLOW
           IDENTIFICATION DIVISION.
           PROGRAM-ID. HRG2A.
           AUTHOR.  TONY GIRGENTI , IST.
           ENVIRONMENT DIVISION.
           CONFIGURATION SECTION.
           SOURCE-COMPUTER. IBM-370.
           OBJECT-COMPUTER. IBM-370.
           INPUT-OUTPUT SECTION.
           FILE-CONTROL.
               SELECT CRD-RDR ASSIGN TO SYS007-UR-1442R-S.
               SELECT D-TAPE  ASSIGN TO SYS023-DA-3340-S
                      ACCESS MODE IS SEQUENTIAL.
               SELECT F-TAPE  ASSIGN TO SYS024-DA-3340-S
                      ACCESS MODE IS SEQUENTIAL.
               SELECT P-TAPE  ASSIGN TO SYS025-DA-3340-S
                      ACCESS MODE IS SEQUENTIAL.
               SELECT  JB-JBW ASSIGN TO SYS015-DA-3340-I
                      ACCESS MODE IS SEQUENTIAL
                      RECORD KEY IS JB-KEY.
               SELECT  PRT-MSG ASSIGN TO SYS008-UR-3203-S.
           DATA DIVISION.
           FILE SECTION.
           FD  CRD-RDR LABEL RECORD IS OMITTED
                      RECORDING MODE IS F
                      RECORD CONTAINS 80  CHARACTERS.
           01  CRD-RECORD.
               05  CRD-FIELD OCCURS 13 TIMES.
                   10  CRD-WU  PICTURE IS X(5).
                   10  CRD-SPACER PICTURE IS X.
               05  FILLER          PICTURE IS XX.
           01  CRD-FIRST REDEFINES CRD-RECORD.
                   10  CRD-TWO-DIGIT    PICTURE IS XX.
                   10  CRD-BLANKS       PICTURE IS X(3).
                   10  CRD-REST         PICTURE IS X(75).
           FD  D-TAPE LABEL RECORD IS STANDARD
                      RECORDING MODE IS F
                      BLOCK CONTAINS 90  RECORDS
                      RECORD CONTAINS 85 CHARACTERS.
           01  D-RECORD.
               05  D-ORG-CODE                   PICTURE IS XXX.
               05  D-JCN-DATE                   PICTURE IS X(5).
               05  D-JCN-DATE-CHK REDEFINES D-JCN-DATE.
                   10  D-JCN-DECADE             PIC 9.
                   10  D-JCN-YR                 PIC X.
                   10  D-JCN-DAY                PIC XXX.
               05  D-JCN-SEQ                    PICTURE IS XXX.
               05  D-JCN-SUF                    PICTURE IS XX.
               05  D-IF-CODE                    PICTURE IS XXXX.
               05  D-BUR-NO                     PICTURE IS X(6).
               05  D-WU-CODE.
                   10  D-TWO-DIGIT-WU           PICTURE IS XX.
                   10  D-REST-OF-WU             PICTURE IS X(5).
               05  D-WU-CODE5 REDEFINES D-WU-CODE.
                   10  D-FIVE-DIGIT-WU          PICTURE IS X(5).
                   10  D-2LEFT                  PICTURE IS XX.
               05  FILLER                       PICTURE IS XX.
               05  D-ML1-DATE                   PICTURE IS XXXX.
               05  D-ML1-DATE-CHK REDEFINES D-ML1-DATE.
                   10  D-ML1-YR                 PIC X.
                   10  D-ML1-DAY                PIC XXX.
               05  D-ATC1                       PICTURE IS X.
               05  D-HMC1                       PICTURE IS XXX.
               05  D-ML2-DATE                   PICTURE IS 9999.
               05  D-ML2-DATE-CHK REDEFINES D-ML2-DATE.
                   10  D-ML2-YR                 PIC X.
                   10  D-ML2-DAY                PIC XXX.
               05  D-ATC2                       PICTURE IS X.
               05  D-HMC2                       PICTURE IS XXX.
               05  FILLER                       PICTURE IS X(5).
               05  D-SERIAL                     PICTURE IS X(10).
               05  FILLER                       PICTURE IS X(16).
               05  D-METER                      PICTURE IS XXXX.
               05  FILLER                       PIC XX.
           FD  F-TAPE LABEL RECORD IS STANDARD
                      BLOCK CONTAINS 60  RECORDS
                      RECORD CONTAINS 126 CHARACTERS.
```

```
00077          01  E-RECORD.
00078              05  E-ORG-CODE              PICTURE IS XXX.
00079              05  E-JCN-DATE              PICTURE IS X(5).
00080              05  E-JCN-SEQ               PICTURE IS XXX.
00081              05  E-JCN-SUF               PICTURE IS XX.
00082              05  E-TF-CODE               PICTURE IS XXXX.
00083              05  E-BUR-NO                PICTURE IS X(6).
00084              05  E-WU-CODE.
00085                  10  E-TWO-DIGIT-WU      PICTURE IS XX.
00086                  10  E-REST-OF-WU        PICTURE IS X(5).
00087              05  E-WU-CODES REDEFINES E-WU-CODE.
00088                  10  E-FIVE-DIGIT-WU     PICTURE IS X(5).
00089                  10  E-2LEFT             PICTURE IS XX.
00090              05  FILLER                  PICTURE IS X(6).
00091              05  E-MMH1                  PICTURE IS X(5).
00092              05  E-EMT1                  PICTURE IS X(5).
00093              05  FILLER                  PICTURE IS X(7).
00094              05  E-MMH2                  PICTURE IS X(5).
00095              05  E-EMT2                  PICTURE IS X(5).
00096              05  FILLER                  PICTURE IS X(63).
00097          FD  P-TAPE  LABEL RECORD IS STANDARD
00098                      RECORDING MODE IS F
00099                      BLOCK CONTAINS 60  RECORDS
00100                      RECORD CONTAINS 134 CHARACTERS.
00101          01  P-RECORD.
00102              05  FILLER                  PICTURE IS XXX.
00103              05  P-JCN-DATE              PICTURE IS X(5).
00104              05  P-JCN-SEQ               PICTURE IS XXX.
00105              05  P-JCN-SUF               PICTURE IS XX.
00106              05  FILLER                  PICTURE IS XXXX.
00107              05  P-BUR-NO                PICTURE IS X(6).
00108              05  P-WU-CODE.
00109                  10  P-TWO-DIGIT-WU      PICTURE IS XX.
00110                  10  P-REST-OF-WU        PICTURE IS X(5).
00111              05  P-WU-CODES REDEFINES P-WU-CODE.
00112                  10  P-FIVE-DIGIT-WU     PICTURE IS X(5).
00113                  10  P-2LEFT             PICTURE IS XX.
00114              05  FILLER                  PICTURE IS X(28).
00115              05  P-NORMU-TIME            PICTURE IS X(5).
00116              05  P-NORS-TIME             PICTURE IS X(5).
00117              05  P-AWM       OCCURS 7 TIMES PICTURE IS 9999.
00118              05  FILLER                  PICTURE IS X(38).
00119          FD  JB-JBW      LABEL RECORD IS STANDARD
00120                      RECORDING MODE IS F
00121                          BLOCK CONTAINS 70  RECORDS
00122                          RECORD CONTAINS 111 CHARACTERS.
00123          01  MERGED-RECORD.
00124              05  DEP-MERGED.
00125                  10  JB-KEY.
00126                      15  JB-WU-CODE          PIC X(5).
00127                      15  JB-BUR-NO   PICTURE IS X(6).
00128                      15  JB-JCN-DATE PICTURE IS X(5).
00129                      15  JB-JCN-SEQ  PICTURE IS XXX.
00130                      15  JB-JCN-SUF  PICTURE IS XX.
00131                  10  FILLER          PICTURE IS X.
00132                  10  JB-TE-CODE      PICTURE IS XXXX.
00133                  10  FILLER          PICTURE IS X.
00134                  10  JB-SER-NO       PICTURE IS X(10).
00135                  10  FILLER          PICTURE IS X.
00136                  10  JB-ORG-CODE     PICTURE IS XXX.
00137                  10  FILLER          PICTURE IS X.
00138                  10  JB-ML1-DATE             PIC XXXXX.
00139                  10  JB-ML1-DATE-CHK REDEFINES JB-ML1-DATE.
00140                      15  JB-ML1-DECADE       PIC 9.
00141                      15  JB-ML1-YR           PIC X.
00142                      15  JB-ML1-DAY          PIC XXX.
00143                  10  FILLER          PICTURE IS X.
00144                  10  JB-ML2-DATE             PIC XXXXX.
00145                  10  JB-ML2-DATE-CHK REDEFINES JB-ML2-DATE.
00146                      15  JB-ML2-DECADE       PIC 9.
00147                      15  JB-ML2-YR           PIC X.
00148                      15  JB-ML2-DAY          PIC XXX.
00149                  10  FILLER          PICTURE IS X.
00150                  10  JB-ATC1         PICTURE IS X.
00151                  10  FILLER          PICTURE IS X.
00152                  10  JB-ATC2         PICTURE IS X.
00153                  10  FILLER          PICTURE IS X.
```

```
                        10  JB-HMC1         PICTURE IS XXX.
                        10  FILLER          PICTURE IS X.
                        10  JB-HMC2         PICTURE IS XXX.
                        10  FILLER          PICTURE IS X.
                        10  JB-METER        PICTURE IS XXXX.
                        10  FILLER          PICTURE IS X.
                    05  P-MERGED.
                        10  JB-EMT1         PICTURE IS X(5).
                        10  FILLER          PICTURE IS X.
                        10  JB-EMT2         PICTURE IS X(5).
                        10  FILLER          PICTURE IS X.
                        10  JB-MMH1         PICTURE IS X(5).
                        10  FILLEP          PICTURE IS X.
                        10  JB-MMH2         PICTURE IS X(5).
                        10  FILLER          PICTURE IS X.
                        10  JB-NORMU-TIME   PICTURE IS X(5).
                        10  FILLER          PICTURE IS X.
                        10  JB-NORS-TIME    PICTURE IS X(5).
                        10  FILLER          PICTURE IS X.
                        10  JB-AWM-TIME     PICTURE IS 9999.
                FD  PRT-MSG        LABEL RECORD IS OMITTED
                                   RECORDING MODE IS F
                                   RECORD CONTAINS 132 CHARACTERS.
                01  DUP-RECORD.
                    05  DUP-MSG.
                        10  FILLER      PICTURE IS X(33).
                        10  DUP-HDR     PICTURE IS X(60).
                        10  DUP-DATE    PICTURE IS X(8).
                        10  FILLER      PICTURE IS X(31).
                01  DUP-TAPE-RECORD REDEFINES DUP-RECORD.
                        10  FILLER      PICTURE IS X(5).
                        10  DUP-ASTR    PICTURE IS X(5).
                        10  FILLER      PICTURE IS XX.
                        10  DUP-REC     PICTURE IS X(110).
                        10  FILLER      PICTURE IS X(10).
                01  DUP-TOTAL-PRINT REDEFINES DUP-TAPE-RECORD.
                        10  FILLER                  PIC X(33).
                        10  DUPT-HDR                PIC X(68).
                        10  FILLER                  PIC X(31).
                01  DUP-TOTALS REDEFINES DUP-TOTAL-PRINT.
                        10  FILLER                  PIC X(54).
                        10  DUP-TOTD                PIC Z(6).
                        10  FILLER                  PIC X(10).
                        10  DUP-TOTE                PIC Z(6).
                        10  FILLER                  PIC X(10).
                        10  DUP-TOTP                PIC Z(6).
                        10  FILLER                  PIC X(40).
                WORKING-STORAGE SECTION.
                77  FIRST-ONE                       PIC 9 VALUE ZERO.
                77  RECORD-CTR                      PIC 999.
                77  TALLY-SAVE                      PIC 99.
                77  TEST-IT                     PICTURE IS 999.
                77  PRT-CTR                         PIC 99.
                77  DCTR                            PIC 9(6) VALUE ZEROS.
                77  ECTR                            PIC 9(6) VALUE ZEROS.
                77  PCTR                            PIC 9(6) VALUE ZEROS.
                77  DPCTR                           PIC 9(6) VALUE ZEROS.
                77  EDCTR                           PIC 9(6) VALUE ZEROS.
                77  PDCTR                           PIC 9(6) VALUE ZEROS.
                77  CPD-SUB       PICTURE IS 99.
                77  WU-SUB        PICTURE IS 999.
                77  TOTAL-WU-CODES                  PIC 999.
                77  INDX1                           PIC 999.
                77  INDX2                           PIC 999.
                77  INDX2A                          PIC 999.
                77  INDX3                           PIC 999.
                77  INDX4                           PIC 999.
                77  TWO-DIGIT-WU      PICTURE IS XX.
                77  PRO-SW        PICTURE IS 9.
                77  FILE-TYPE     PICTURE IS 9.
                77  DCTR1                           PIC 9(6) VALUE ZEROS.
                77  DCTR2                           PIC 9(6) VALUE ZEROS.
                77  DCTR3                           PIC 9(6) VALUE ZEROS.
                77  DCTR4                           PIC 9(6) VALUE ZEROS.
                77  DCTR5                           PIC 9(6) VALUE ZEROS.
                77  DCTR6                           PIC 9(6) VALUE ZEROS.
                77  DCTR7                           PIC 9(6) VALUE ZEROS.
```

```
       77  DCTR8                               PIC 9(6) VALUE ZEROS.
       77  DCTR9                               PIC 9(6) VALUE ZEROS.
       77  DCTR10                              PIC 9(6) VALUE ZEROS.
       77  ECTR1                               PIC 9(6) VALUE ZEROS.
       77  ECTR2                               PIC 9(6) VALUE ZEROS.
       77  ECTR3                               PIC 9(6) VALUE ZEROS.
       77  PCTR1                               PIC 9(6) VALUE ZEROS.
       77  PCTR2                               PIC 9(6) VALUE ZEROS.
       77  PCTR3                               PIC 9(6) VALUE ZEROS.
       77  HDP-MSG       PICTURE IS X(60) VALUE IS  THE FOLLOWING RECORDS
      -                  ARF DUPLICATED  PROGRAM NO 2A   DATE      .
       77  HDR1     PIC X(68) VALUE  ****************************************
      -             ******************************        .
       77  HDR2     PIC X(68) VALUE  *               *       DTAPE      *
      -               ETAPE      *     PTAPE         *  .
       77  HDR3     PIC X(68) VALUE  * NUMBER OF        *                 *
      -                          *                   *  .
       77  HDR4     PIC X(68) VALUE  * RECORDS          *                 *
      -                          *                   *  .
       77  HDR5     PIC X(68) VALUF  * READ IN          *                 *
      -                          *                   *  .
       77  HDR6     PIC X(68) VALUE  * DUPLICATE        *                 *
      -                          *                   *  .
       77  HDR7     PIC X(68) VALUE  * RECORDS USED     *                 *
      -                          *                   *  .
       77  HDR8     PIC X(68) VALUE  * IN MERGE         *                 *
      -                          *                   *  .
       77  HDR9     PIC X(60) VALUE  TOTALS FOR PROGRAM NO 2A
      -                               DATE   .
       77  HDR10    PIC X(69) VALUF        SOURCE
      -                            DATA RECORD         .
       77  HDR11    PIC X(68) VALUE  * ERRORS           *                 *
      -                          *                   *  .
       77  HDR12    PIC X(68) VALUE  * WU-CODE SPACE    *                 *
      -                          *                   *  .
       77  HDR13    PIC X(68) VALUE  * JCN-DAT ALPHA    *                 *
      -                          *                   *  .
       77  HDR14    PIC X(68) VALUE  * ML1-DAT ALPHA    *                 *
      -                          *                   *  .
       77  HDR15    PIC X(68) VALUE  * ML2-DAT ALPHA    *                 *
      -                          *                   *  .
       77  HDR16    PIC X(68) VALUE  * METER ALPHA      *                 *
      -                          *                   *  .
       77  HDR17    PIC X(68) VALUE  * ML1 LT JCN       *                 *
      -                          *                   *  .
       77  HDR18    PIC X(68) VALUE  * ML2 LT ML1       *                 *
      -                          *                   *  .
       77  HDF19    PIC X(68) VALUE  * MMH1 ALPHA       *                 *
      -                          *                   *  .
       77  HDR20    PIC X(68) VALUF  * MMH2 ALPHA       *                 *
      -                          *                   *  .
       77  HDR21    PIC X(68) VALUE  * NORMU ALPHA      *                 *
      -                          *                   *  .
       77  HDR22    PIC X(68) VALUF  * NORS ALPHA       *                 *
      -                          *                   *  .
       77  HDR23    PIC X(68) VALUE  * AWM ALPHA        *                 *
      -                          *                   *  .
       77  HDR24    PIC X(68) VALUE  * SEQ ALPHA        *                 *
      -                          *                   *  .
       77  HDR25    PIC X(68) VALUE  * SELECTED         *                 *
      -                          *                   *  .
       77  HDP26    PIC X(68) VALUE  * WU-CODE          *                 *
      -                          *                   *  .
       77  HDR27    PIC X(68) VALUE  * RECORDS          *                 *
      -                          *                   *  .
       77  HDR28    PIC X(68) VALUE  NO MATCH FOR THE FOLLOWING DRECORD .
       77  HDR29    PIC X(68) VALUE  * MERGED RECDS   *                   *
      -                          *                   *  .
       77  TEST-MSG      PICTURE IS X(44) VALUE IS  ***** HOW MANY UNBYPAS
      -                   SED RECORDS FOR TEST    .
       01  FIVE=DIGIT-WU-TABLF.
           05  WU-CODF OCCURS  500 TIMFS PICTURE IS X(5).
       01  PREV-D-PECORD.
           05  FILLER                  PICTURE IS XXX.
           05  PRLV-D-JCN-DATF         PICTURE IS X(5).
           05  PRFV-D-JCN-SFQ          PICTURF IS XXX.
           05  PREV-D-JCH-SUF          PICTURE IS XX.
       05  FILLER                PICTURE IS XXXX.
       05  PREV-D-BUR-NO         PICTURE IS X(6).
       05  FILLER                PICTURE IS X(62).
01  D-SEQ.
       05  DS-WU-CODE                   PIC X(5) VALUE SPACES.
       05  DS-BUR-NO                    PIC X(6) VALUE SPACES.
       05  DS-JCN-DATE                  PIC X(5) VALUE SPACES.
       05  DS-JCN-SEQ                   PIC XXX VALUE SPACES.
       05  DS-JCN-SUF                   PIC XX VALUE SPACES.
01  E-SEQ.
       05  ES-WU-CODE                   PIC X(5) VALUE SPACES.
       05  ES-BUR-NO                    PIC X(6) VALUE SPACES.
       05  ES-JCN-DATE                  PIC X(5) VALUE SPACES.
       05  ES-JCN-SEQ                   PIC XXX VALUE SPACES.
       05  ES-JCN-SUF                   PIC XX VALUE SPACES.
01  P-SEQ.
       05  PS-WU-CODE                   PIC X(5) VALUE SPACES.
       05  PS-BUR-NO                    PIC X(6) VALUE SPACES.
       05  PS-JCN-DATE                  PIC X(5) VALUE SPACES.
       05  PS-JCN-SEQ                   PIC XXX VALUE SPACES.
       05  PS-JCN-SUF                   PIC XX VALUE SPACES.
PROCEDURE DIVISION.
                    MOVE 1 TO WU-SUB.
                    MOVE ZEROS TO PREV-D-RECORD.
                    MOVE 28 TO PRT-CTR.
                    OPEN INPUT CRD-RDR.
READ-A-CARD.
                    MOVE SPACES TO CRD-RECORD.
                    MOVE 1 TO CRD-SUB.
       READ CRD-RDR RECORD AT END GO TO OPEN-TAPE-FILES.
       IF CRD-BLANKS IS NOT EQUAL TO SPACES
             GO TO FIVE-DIGIT-TABLE-SETUP.
                    MOVE CRD-TWO-DIGIT TO TWO-DIGIT-WU.
                    ADD 1 TO CRD-SUB.
FIVE-DIGIT-TABLE-SETUP.
       IF   CRD-WU (CRD-SUB) EQUAL  SPACES
             GO TO READ-A-CARD.
                    MOVE CRD-WU (CRD-SUB) TO WU-CODE (WU-SUB).
                    ADD 1 TO CRD-SUB.
                    ADD 1 TO WU-SUB.
       IF   CRD-SUB IS GREATER THAN 13
             GO TO READ-A-CARD.
                    GO TO FIVE-DIGIT-TABLE-SETUP.
OPEN-TAPE-FILES.
                    SUBTRACT 1 FROM WU-SUB.
                    MOVE WU-SUB TO INDX3, TOTAL-WU-CODES.
       OPEN INPUT D-TAPE.
       OPEN INPUT E-TAPE.
       OPEN INPUT P-TAPE.
             OPEN OUTPUT PRT-MSG
             OPEN OUTPUT JB-JBW.
                    CLOSE CRD-RDR.
                    MOVE ZEROS TO RECORD-CTR.
                    MOVE ZERO TO PRO-SW.
READ-D-TAPE.
                    MOVE 1 TO WU-SUB.
                    MOVE SPACES TO D-RECORD, MERGED-RECORD.
       READ D-TAPE RECORD AT END
             GO TO CLOSE-OUT.
                    ADD 1 TO DCTR.
                    MOVE D-WU-CODE        TO DS-WU-CODE.
                    MOVE D-BUR-NO         TO DS-BUR-NO.
                    MOVE D-JCN-DATE       TO DS-JCN-DATE.
                    MOVE D-JCN-SEQ        TO DS-JCN-SEQ.
                    MOVE D-JCN-SUF        TO DS-JCN-SUF.
       IF   D-TWO-DIGIT-WU = TWO-DIGIT-WU
             GO TO DUP-RECORD-CHECK.
       IF   D-FIVE-DIGIT-WU LESS THAN WU-CODE (1)
             GO TO READ-D-TAPE.
       IF D-FIVE-DIGIT-WU GREATER THAN WU-CODE (INDX3)
             GO TO READ-D-TAPE.
                    MOVE 1 TO INDX1.
START-SEARCH.
                    SUBTRACT INDX1 FROM INDX3 GIVING INDX4.
       IF INDX4 = 1
             GO TO ONLY-TWO-LEFT.
                    ADD INDX1, INDX3, 1 GIVING INDX2A.
```

```
                DIVIDE 2 INTO INDX2A GIVING INDX2.
        IF D-FIVE-DIGIT-WU LESS THAN WU-CODE (INDX2)
            MOVE INDX2 TO INDX3
            GO TO START-SEARCH.
                MOVE INDX2 TO INDX1.
                GO TO START-SEARCH.
    ONLY-TWO-LEFT.
        IF D-FIVE-DIGIT-WU = WU-CODE (INDX1) OR
            D-FIVE-DIGIT-WU = WU-CODE (INDX3)
            NEXT SENTENCE
        ELSE
            GO TO READ-D-TAPE.
    DUP-RECORD-CHECK.
                ADD 1 TO DCTR9.
                MOVE 1 TO FILE-TYPE.
        IF  PREV-D-BUR-NO IS EQUAL TO D-BUR-NO  AND
            PREV-D-JCN-DATE IS EQUAL TO D-JCN-DATE AND
            PREV-D-JCN-SEQ  IS EQUAL TO D-JCN-SEQ  AND
            PREV-D-JCN-SUF  IS EQUAL TO D-JCN-SUF
            PERFORM DUP-RECORD-PRINT THRU DRP-EXIT
            GO TO READ-D-TAPE.
                MOVE D-RECORD TO PREV-D-RECORD.
                MOVE ZERO TO FIRST-ONE.
                EXAMINE D-WU-CODE TALLYING ALL SPACES.
        IF  TALLY IS GREATER THAN ZERO
            ADD 1 TO DCTR1
            GO TO READ-D-TAPE.
                EXAMINE D-JCN-DATE REPLACING ALL SPACES BY ZERO.
                EXAMINE D-JCN-SEQ REPLACING ALL SPACE BY ZERO.
                EXAMINE D-ML1-DATE REPLACING ALL SPACES BY ZERO.
                EXAMINE D-METER     REPLACING ALL SPACES BY ZERO.
        IF  D-JCN-DATE NOT NUMERIC
            ADD 1 TO DCTR2
            GO TO READ-D-TAPE.
        IF  D-JCN-SEQ  NOT NUMERIC
            ADD 1 TO DCTR8
            GO TO READ-D-TAPE.
        IF  D-ML1-DATE NOT NUMERIC
            ADD 1 TO DCTR3
            GO TO READ-D-TAPE.
        IF  D-METER     NOT NUMERIC
            ADD 1 TO DCTR5
            GO TO READ-D-TAPE.
        IF  D-ML1-YR IS LESS THAN D-JCN-YR
            ADD 1     D-JCN-DECADE GIVING JB-ML1-DECADE
        ELSE
            MOVE D-JCN-DECADE TO JB-ML1-DECADE.
                MOVE D-ML1-YR TO JB-ML1-YR.
                MOVE D-ML1-DAY TO JB-ML1-DAY.
        IF  JB-ML1-DATE IS LESS THAN D-JCN-DATE
            ADD 1 TO DCTR6.
            GO TO READ-D-TAPE.
        IF  D-AIC2 = SPACE OR
            D-AIC2 = ZERO
            MOVE ZEROS TO JB-ML2-DATE
            GO TO MOVE-D-RECORD.
        IF  D-ML2-DATE-CHK = SPACES
            ADD 1 TO DCTR4
            GO TO READ-D-TAPE.
                EXAMINE D-ML2-DATE-CHK REPLACING ALL SPACES BY ZERO.
        IF  D-ML2-DATE NOT NUMERIC
            ADD 1 TO DCTR4
            GO TO READ-D-TAPE.
        IF  D-ML2-YR IS LESS THAN D-ML1-YR
            ADD 1   JB-ML1-DECADE GIVING JB-ML2-DECADE
        ELSE
            MOVE JB-ML1-DECADE TO JB-ML2-DECADE.
                MOVE D-ML2-YR TO JB-ML2-YR.
                MOVE D-ML2-DAY TO JB-ML2-DAY.
        IF  JB-ML2-DATE IS LESS THAN JB-ML1-DATE
            ADD 1 TO DCTR7
            GO TO READ-D-TAPE.
    MOVE-D-RECORD.
                MOVE D-ORG-CODE  TO JB-ORG-CODE.
                MOVE D-JCN-DATE  TO JB-JCN-DATE.
                MOVE D-JCN-SEQ   TO JB-JCN-SEQ.
                MOVE D-JCN-SUF   TO JB-JCN-SUF.
            MOVE D-IE-CODE   TO JB-IE-CODE.
            MOVE D-BUR-NO    TO JB-BUR-NO.
            MOVE D-FIVE-DIGIT-WU TO JB-WU-CODE.
            MOVE D-ATC1      TO JB-ATC1.
            MOVE D-HMC1      TO JB-HMC1.
            MOVE D-ATC2      TO JB-ATC2.
            MOVE D-HMC2      TO JB-HMC2.
            MOVE D-SERIAL    TO JB-SER-NO.
            EXAMINE D-SERIAL TALLYING ALL SPACES.
            MOVE TALLY TO TALLY-SAVE.
            EXAMINE D-SERIAL TALLYING ALL ZEROS.
            ADD TALLY TO TALLY-SAVE.
    IF  TALLY-SAVE IS LESS THAN 10
        NEXT SENTENCE ELSE
        MOVE SPACES TO JB-SER-NO.
            MOVE D-METER     TO JB-METER.
            ADD 1 TO ECTR.
READ-E-TAPE.
    IF  E-SEQ = D-SEQ
        GO TO PROC-E-RECORD.
    IF  E-SEQ IS GREATER THAN D-SEQ
        PERFORM NO-MATCH-PRINT
        GO TO READ-D-TAPE.
    READ E-TAPE RECORD AT END
        GO TO CLOSE-OUT.
            MOVE E-WU-CODE       TO ES-WU-CODE.
            MOVE E-BUR-NO        TO ES-BUR-NO.
            MOVE E-JCN-DATE      TO ES-JCN-DATE.
            MOVE E-JCN-SEQ       TO ES-JCN-SEQ.
            MOVE E-JCN-SUF       TO ES-JCN-SUF.
        GO TO READ-E-TAPE.
PROC-E-RECORD.
            EXAMINE E-MMH1 REPLACING ALL SPACES BY ZERO.
            EXAMINE E-MMH2 REPLACING ALL SPACES BY ZERO.
    IF  E-MMH1 NOT NUMERIC
        ADD 1 TO ECTR1
        GO TO READ-D-TAPE.
    IF  E-MMH2 NOT NUMERIC
        ADD 1 TO ECTR2
        GO TO READ-D-TAPE.
MOVE-E-RECORD.
            MOVE E-MMH1 TO  JB-MMH1.
            MOVE E-EMT1 TO  JB-EMT1.
            MOVE E-MMH2 TO  JB-MMH2.
            MOVE E-EMT2 TO  JB-EMT2.
            ADD 1 TO PCTR.
READ-P-TAPE.
    IF  P-SEQ = D-SEQ
        GO TO PROC-P-RECORD.
    IF  P-SEQ IS GREATER THAN D-SEQ
        PERFORM NO-MATCH-PRINT
        GO TO READ-D-TAPE.
    READ P-TAPE RECORD AT END
        GO TO CLOSE-OUT.
            MOVE P-WU-CODE       TO PS-WU-CODE.
            MOVE P-BUR-NO        TO PS-BUR-NO.
            MOVE P-JCN-DATE      TO PS-JCN-DATE.
            MOVE P-JCN-SEQ       TO PS-JCN-SEQ.
            MOVE P-JCN-SUF       TO PS-JCN-SUF.
        GO TO READ-P-TAPE.
PROC-P-RECORD.
            EXAMINE P-NORMU-TIME REPLACING ALL SPACES BY ZERO.
            EXAMINE P-NORS-TIME  REPLACING ALL SPACES BY ZERO.
    IF  P-NORMU-TIME NOT NUMERIC
        ADD 1 TO PCTR1
        GO TO READ-D-TAPE.
    IF  P-NORS-TIME  NOT NUMERIC
        ADD 1 TO PCTR2
        GO TO READ-D-TAPE.
    IF  P-AWM (1)     NOT NUMERIC
        ADD 1 TO PCTR3
        GO TO READ-D-TAPE.
    IF  P-AWM (2)     NOT NUMERIC
        ADD 1 TO PCTR3
        GO TO READ-D-TAPE.
    IF  P-AWM (3)     NOT NUMERIC
        ADD 1 TO PCTR3
```

```
               GO TO READ-D-TAPE.
           IF  P-AWM (4)    NOT NUMERIC
               ADD 1 TO PCTR3
               GO TO READ-D-TAPE.
           IF  P-AWM (5)    NOT NUMERIC
               ADD 1 TO PCTR3
               GO TO READ-D-TAPE.
           IF  P-AWM (6)    NOT NUMERIC
               ADD 1 TO PCTR3
               GO TO READ-D-TAPE.
           IF  P-AWM (7)    NOT NUMERIC
               ADD 1 TO PCTR3
               GO TO READ-D-TAPE.
       MOVE-P-RECORD.
                   MOVE P-NORMU-TIME TO JB-NORMU-TIME.
                   MOVE P-NORS-TIME  TO JB-NORS-TIME.
                   ADD P-AWM (1), P-AWM (2), P-AWM (3), P-AWM (4),
                   P-AWM (5), P-AWM (6), P-AWM (7) GIVING JB-AWM-TIME.
                   GO TO WRITE-DISK-RECORD.
       NO-MATCH-PRINT.
                   MOVE SPACES TO DUP-RECORD.
                   MOVE HDR28 TO DUPT-HDR.
                   WRITE DUP-RECORD AFTER POSITIONING 2 LINES.
                   MOVE SPACES TO DUP-RECORD:
                   MOVE D-RECORD TO DUPT-HDR.
                   WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
       DUP-RECORD-PRINT.
           IF  PRT-CTR IS LESS THAN 28
               GO TO PRINT-DATA-RECORD.
                   MOVE SPACES TO DUP-RECORD.
                   MOVE HDR-MSG TO DUP-HDR.
                   MOVE CURRENT-DATE TO DUP-DATE.
           WRITE DUP-RECORD AFTER POSITIONING 0 LINES.
                   MOVE SPACES TO DUP-RECORD.
                   MOVE HDR10 TO DUP-RECORD.
           WRITE DUP=RECORD AFTER POSITIONING 1 LINES.
                   MOVE ALL  *  TO DUP-ASTR, DUP-REC.
           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
                   MOVE ZEROS TO PRT-CTR.
       PRINT-DATA-RECORD.
           IF  FIRST-ONE = ZERO
               MOVE 1 TO FIRST-ONE
               ADD 1 TO PRT-CTR
               MOVE SPACES TO DUP-RECORD
               MOVE  FIRST  TO DUP-ASTR
               MOVE PREV-D-RECORD TO DUP-REC
               WRITE DUP-RECORD AFTER POSITIONING 2 LINES.
                   MOVE SPACES TO DUP-RECORD.
           IF  FILE-TYPE IS EQUAL TO 1
                   MOVE  DTAPE  TO DUP-ASTR
                   ADD 1 TO DDCTR
                   MOVE D-RECORD TO DUP-REC.
           IF  FILE-TYPE IS EQUAL TO 2
                   MOVE  ETAPE  TO DUP-ASTR
                   ADD 1 TO EDCTR
                   MOVE E-RECORD TO DUP-REC.
           IF  FILE-TYPE IS EQUAL TO 3
                   MOVE  PTAPE  TO DUP-ASTR
                   ADD 1 TO PDCTR
                   MOVE P-RECORD TO DUP-REC.
           WRITE DUP-RECORD AFTER POSITIONING 2 LINES. '
                   ADD 1 TO PRT-CTR.
       DRP-EXIT.
           EXIT.
       WRITE-DISK-RECORD.
                   ADD 1 TO DCTR10.
           WRITE MERGED=RECORD
                 INVALID KEY DISPLAY   INVALID KEY FOR JBFILE =
                 JB-KEY UPON SYSLST.
               GO TO READ-D-TAPE.
       CLOSE-OUT SECTION.
           CLOSE D-TAPE.
           CLOSE E-TAPE.
           CLOSE P-TAPE.
           CLOSE JB-JBW.
                   MOVE SPACES TO DUP-RECORD.
                   MOVE CURRENT-DATE TO DUP-DATE.
```

```
00616                    MOVE HDR9 TO DUP-HDR.
00617            WRITE DUP-RECORD AFTER POSITIONING 0 LINES.
00618                    MOVE SPACES TO DUP=RECORD.
00619                    MOVE ALL  -  TO DUP-HDR, DUP-DATE.
00620            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00621                    MOVE SPACES TO DUP-RECORD.
00622                    MOVE HDR1 TO DUPT-HDR.
00623            WRITE DUP-RECORD AFTER POSITIONING 3 LINES.
00624                    MOVE SPACES TO DUP-RECORD.
00625                    MOVE HDR2 TO DUPT-HDR.
00626            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00627                    MOVE SPACES TO DUP-RECORD.
00628                    MOVE HDR1 TO DUPT-HDR.
00629            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00630                    MOVE SPACES TO DUP-RECORD.
00631                    MOVE HDR3 TO DUPT-HDR.
00632            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00633                    MOVE SPACES TO DUP-RECORD.
00634                    MOVE HDR4 TO DUPT-HDR.
00635                    MOVE DCTR TO DUP-TOTD.
00636                    MOVE ECTR TO DUP-TOTE.
00637                    MOVE PCTR TO DUP-TOTP.
00638            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00639                    MOVE SPACES TO DUP-RECORD.
00640                    MOVE HDR5 TO DUPT-HDR.
00641            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00642                    MOVE SPACES TO DUP-RECORD.
00643                    MOVE HDR1 TO DUPT-HDR.
00644            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00645                    MOVE SPACES TO DUP-RECORD.
00646                    MOVE HDR25 TO DUPT-HDR.
00647            WRITE DUP=RECORD AFTER POSITIONING 1 LINES.
00648                    MOVE SPACES TO DUP-RECORD.
00649                    MOVE HDR26 TO DUPT-HDR.
00650                    MOVE DCTR9 TO DUP-TOTD.
00651            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00652                    MOVE SPACES TO DUP-RECORD.
00653                    MOVE HDR27 TO DUPT-HDR.
00654            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00655                    MOVE SPACES TO DUP-RECORD.
00656                    MOVE HDR1  TO DUPT-HDR.
00657            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00658                    MOVE SPACES TO DUP-RECORD.
00659                    MOVE HDR3 TO DUPT-HDR.
00660            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00661                    MOVE SPACES TO DUP-RECORD.
00662                    MOVE HDR6 TO DUPT-HDR.
00663                    MOVE DDCTR TO DUP-TOTD.
00664                    MOVE EDCTR TO DUP-TOTE.
00665                    MOVE PDCTR TO DUP-TOTP.
00666            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00667                    MOVE SPACES TO DUP-RECORD.
00668                    MOVE HDR4 TO DUPT-HDR.
00669            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00670                    MOVE SPACES TO DUP-RECORD,
00671                    MOVE HDR1 TO DUPT-HDR.
00672            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00673                    MOVE SPACES TO DUP-RECORD.
00674                    MOVE HDR1 TO DUPT-HDR.
00675            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00676                    MOVE SPACES TO DUP-RECORD.
00677                    MOVE HDR11 TO DUPT-HDR.
00678                    ADD DCTR1, DCTR2, DCTR3, DCTR4, DCTR5, DCTR6,
00679                            DCTR7, DCTR8.        GIVING DUP-TOTD.
00680                    ADD ECTR1, ECTR2 GIVING DUP-TOTE.
00681                    ADD PCTR1, PCTR2, PCTR3 GIVING DUP-TOTP.
00682            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00683                    MOVE SPACES TO DUP-RECORD.
00684                    MOVE HDR1 TO DUPT-HDR.
00685            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00686                    MOVE SPACES TO DUP-RECORD.
00687                    MOVE HDR12 TO DUPT-HDR.
00688                    MOVE DCTR1 TO DUP-TOTD.
00689                    MOVE ZEROS TO DUP-TOTE.
00690                    MOVE ZEROS TO DUP-TOTP.
00691            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00692                    MOVE SPACES TO DUP-RECORD.
```

```
00693                MOVE HDR1 TO DUPT-HDR.
00694           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00695                MOVE SPACES TO DUP-RECORD.
00696                MOVE HDR13 TO DUPT-HDR.
00697                MOVE DCTR2 TO DUP-TOTD.
00698                MOVE ZEROS TO DUP-TOTE.
00699                MOVE ZEROS TO DUP-TOTP.
00700           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00701                MOVE SPACES TO DUP-RECORD.
00702                MOVE HDR1 TO DUPT-HDR.
00703           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00704                MOVE SPACES TO DUP-RECORD.
00705                MOVE HDR24 TO DUPT-HDR.
00706                MOVE DCTR8 TO DUP-TOTD.
00707                MOVE ZEROS TO DUP-TOTE, DUP-TOTP.
00708           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00709                MOVE SPACES TO DUP-RECORD.
00710                MOVE HDR1  TO DUPT-HDR.
00711           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00712                MOVE SPACES TO DUP-RECORD.
00713                MOVE HDR14 TO DUPT-HDR.
00714                MOVE DCTR3 TO DUP-TOTD.
00715                MOVE ZEROS TO DUP-TOTE.
00716                MOVE ZEROS TO DUP-TOTP.
00717           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00718                MOVE SPACES TO DUP-RECORD.
00719                MOVE HDR1 TO DUPT-HDR.
00720           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00721                MOVE SPACES TO DUP-RECORD.
00722                MOVE HDR16 TO DUPT-HDR.
00723                MOVE DCTR5 TO DUP-TOTD.
00724                MOVE ZEROS TO DUP-TOTE.
00725                MOVE ZEROS TO DUP-TOTP.
00726           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00727                MOVE SPACES TO DUP-RECORD.
00728                MOVE HDR1 TO DUPT-HDR.
00729           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00730                MOVE SPACES TO DUP-RECORD.
00731                MOVE HDR17 TO DUPT-HDR.
00732                MOVE DCTR6 TO DUP-TOTD.
00733                MOVE ZEROS TO DUP-TOTE.
00734                MOVE ZEROS TO DUP-TOTP.
00735           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00736                MOVE SPACES TO DUP-RECORD.
00737                MOVE HDR1 TO DUPT-HDR.
00738           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00739                MOVE SPACES TO DUP-RECORD.
00740                MOVE HDR15 TO DUPT-HDR.
00741                MOVE DCTR4 TO DUP-TOTD.
00742                MOVE ZEROS TO DUP-TOTE.
00743                MOVE ZEROS TO DUP-TOTP.
00744           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00745                MOVE SPACES TO DUP-RECORD.
00746                MOVE HDR1 TO DUPT-HDR.
00747           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00748                MOVE SPACES TO DUP-RECORD.
00749                MOVE HDR18 TO DUPT-HDR.
00750                MOVE DCTR7 TO DUP-TOTD.
00751                MOVE ZEROS TO DUP-TOTE.
00752                MOVE ZEROS TO DUP-TOTP.
00753           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00754                MOVE SPACES TO DUP-RECORD.
00755                MOVE HDR1 TO DUPT-HDR.
00756           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00757                MOVE SPACES TO DUP-RECORD.
00758                MOVE HDR19 TO DUPT-HDR.
00759                MOVE ECTR1 TO DUP-TOTE.
00760                MOVE ZEROS TO DUP-TOTD.
00761                MOVE ZEROS TO DUP-TOTP.
00762           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00763                MOVE SPACES TO DUP-RECORD.
00764                MOVE HDR1 TO DUPT-HDR.
00765           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00766                MOVE SPACES TO DUP-RECORD.
00767                MOVE HDR20 TO DUPT-HDR.
00768                MOVE ECTR2 TO DUP-TOTE.
00769                MOVE ZEROS TO DUP-TOTD.
```

```
00770                  MOVE ZEROS TO DUP-TOTP.
00771             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00772                  MOVE SPACES TO DUP-RECORD.
00773                  MOVE HDR1 TO DUPT-HDR.
00774             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00775                  MOVE SPACES TO DUP-RECORD.
00776                  MOVE HDR21 TO DUPT-HDR.
00777                  MOVE PCTR1 TO DUP-TOTP.
00778                  MOVE ZEROS TO DUP-TOTD.
00779                  MOVE ZEROS TO DUP-TOTE.
00780             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00781                  MOVE SPACES TO DUP-RECORD.
00782                  MOVE HDR1 TO DUPT-HDR.
00783             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00784                  MOVE SPACES TO DUP-RECORD.
00785                  MOVE HDR22 TO DUPT-HDR.
00786                  MOVE PCTR2 TO DUP-TOTP.
00787                  MOVE ZEROS TO DUP-TOTD.
00788                  MOVE ZEROS TO DUP-TOTE.
00789             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00790                  MOVE SPACES TO DUP-RECORD.
00791                  MOVE HDR1   TO DUPT-HDR.
00792             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00793                  MOVE SPACES TO DUP-RECORD.
00794                  MOVE HDR23 TO DUPT-HDR.
00795                  MOVE PCTR3 TO DUP-TOTP.
00796                  MOVE ZEROS TO DUP-TOTD.
00797                  MOVE ZEROS TO DUP-TOTE.
00798             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00799                  MOVE SPACES TO DUP-RECORD.
00800                  MOVE HDR1 TO DUPT-HDR.
00801             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00802                  MOVE SPACES TO DUP-RECORD.
00803                  MOVE HDR29 TO DUPT-HDR.
00804                  MOVE DCTR10  TO DUP-TOTP.
00805             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00806                  MOVE SPACES TO DUP-RECORD.
00807                  MOVE HDR1 TO DUPT-HDR.
00808             WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00809             CLOSE PRT-MSG.
00810             STOP RUN.
```

```
                            THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                         DATA RECORD
*****  **************************************************************************************************************

FIRST  AA277105951  AFWA1590231112100087136U799       26512178        A51B170005    A057217
DTAPE  AA277105953  AFWA1590231112100087136U799    *  82577DHR0017    481031158     M104217
FIPST  AB276329634  AFWA15942611121000B6329T799    *  26512C9981      A51B170007    A051816
DTAPE  AB276329634  AFWA15942611121000B6329T799       70210GDA012     94995081      M098626
FIRST  AG877223364  AFWA15944174A1A000B7243U799    *  82577DHR0005    481015156     M052317
DTAPE  AG877223364  AFWA15944174A1A000B7243U799       82577DHR0005    481015156     M052317
FIPST  AG877264364  AFWA15944174A1A00MB7265R290    *  82577ENA0041    481015156     M079826
DTAPE  AG877264364  AFWA15944174A1A00MB7265R2907267C25582577ENA0041   481015156     M079826
FIRST  AC177244152  AFWA15863174A1C000B7244T799    *  82577DHR0052    481042150     M040516
DTAPE  AC177244152  AFWA15863174A1C000B7244T799       82577DHR19      481022156     M173316
FIRST  AC177244153  AFWA15863174A1C000B7252U799       82577HPG0003    481022156     M032317
DTAPE  AC177244153  AFWA15863174A1C000B7252U799    *  82577ENA0065    481042150     M128417
FIRST  AB276276069  AFWA15901574A1C00HB6307RC036319C12782577DHR0027   481022156     M127726
DTAPE  AB276276069  AFWA15901574A1C00HB6307RC03    *  72914C55160     80026113      A040716
FIRST  AG877243245  AFWA15943574A1C000B7260U799    *  82577DHR0019    481022156     M241517
DTAPE  AG877243245  AFWA15943574A1C000B7260U799       82577DHR0019    481022156     M241517
FIRST  AG877242383  AFWA15943774A1C00HB0000    00000000000000000000000000000000000000000000
DTAPE  AG777242383  AFWA15943774A1C00HB7249RC037245C25582577GLX0097   481022156     M010426
FIRST  AG777017975  AFWA15960574A1C000B0000    7017C29082577          481022156          31
DTAPE  AC177017975  AFWA15960574A1C000B7017R290       82577ENA0040    481022156     M055926
FIRST  AC177197045  AFWA16038774A1C00WB0000    00000000000000000000000000000000000000000000
DTAPE  AE177197045  AFWA16038774A1C00DB7199R2907202C25582577DHR0018   481022156     M161426
FIRST  AB277167007  AFWA15901574A1G000B7167T799                                          17
DTAPE  AB277167007  AFWA15901574A1G000B7167T799    *                                     17
FIRST  AA276358987  AFWA15942574A1G000B6363U799    *  82577DHR0048    481031158     M096117
DTAPE  AA276358987  AFWA15942574A1G000B6363U799       82577DHR004     481031160     M096217
FIRST  AG877220538  AFWA15943074A1G00HB7220R381    *  82577EWJ0018    481031158     M039126
DTAPE  AG877220538  AFWA15943074A1G00HB7220R3817221C38100624000000    AE96261E      A061626
```

```
                         THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                      DATA RECORD
*****   *****************************************************************************************************
FIRST   AG877220322   AFWA15944174A1G000B7256U799    *   82577EWJ0028   481031158      M019517
DTAPE   AG877220322   AFWA15944174A1G000B7256U799        82577EWJ0028   481031158      M019517
FIRST   AG877230126   AFWA15944274A1G00HB7231R374        82577ENA0017   481031158      M101926
DTAPE   AG877230126   AFWA15944274A1G00HB7231R374    *   82577ENA0017   481031158      M101926
FIRST   AG777008523   AFWA15944774A1G00DB0000     7010C38382577     481031158           31
DTAPE   AG877008523   AFWA15944774A1G00DB7009R242        82577EWJ24     481031158      M081226
FIRST   AE277221388   AFWA16039074A1G00HB7222R9707221C38182577EWJ26     481031158      M044526
DTAPE   AE277221388   AFWA16039074A1G00HB7222R970    *   82577EWJ26     481031158      M044526
FIRST   AE277256389   AFWA16039074A1G00KB7257R900    *   82577DXP0007   481031158      M133226
DTAPE   AE277256389   AFWA16039074A1G00KB7257R9007258107097153714 4AK054100159864 8      A008726
FIRST   AA277229963   AFWA15902374A1H000B7230U799        82577DHR00038  481039156      M165217
DTAPE   AA277229963   AFWA15902374A1H000B7230U799    *   265120000      T0139700       A079117
FIRST   AG876282565   AFWA15945074A1H00YB6282R242    *   17863CSS115    8600700557     M146516
DTAPE   AG876282565   AFWA15945074A1H00YB6282R242        82577DXP0017   481039156      M168626
FIRST   AE277213423   AFWA16039174A1H00HB7214R2907214C12782577HPG017    481039156      M019426
DTAPE   AE277213423   AFWA16039174A1H00HB7214R290    *   82577HPG017    481039156      M019426
FIRST   AC176280146   AFWA15862574A1K000B6286U799    *   82577EWJ0020   481081158      M084717
DTAPE   AC176280146   AFWA15862574A1K000B6286U7996282C08026512001       A51A1010215    A029226
FIRST   AA277127231A  AFWA15942374A1K91VB0000     000000000000000000000000000000000000000000000
DTAPE   AB277127231A  AFWA15942374A1K90WB0000     7146C29082577     3243589             31
FIRST   AG776341345   AFWA15943774A1K000B6341T799    *   82577DXP0042   481081160      M088716
DTAPE   AG776341345   AFWA15943774A1K000B6341T7997056424277045 2016     A51A90273      A075626
FIRST   AB276288486   AFWA15958974A1K00HB6288RC036288A79982577ENA0007   481081160      M164326
DTAPE   AB276288486   AFWA15958974A1K00HB6288RC03    *   82577DXP0015   481011160      M022516
FIRST   AB277156463   AFWA15958974A1K000B7156T799        82577DHR0006   481081160      M172216
DTAPE   AB277156463   AFWA15958974A1K000B7156T799    *   8009921500     76010701       A026316
FIRST   AB277154447   AFWA15959974A1L000B7157T799    *   86360CSS064    755300000007   M169717
DTAPE   AB277154447   AFWA15959974A1L000B7157T799        82577EWJ0013   481022156      M106516
```

```
                                     THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                            DATA RECORD
*****  ******************************************************************************************************

FIRST  AG877136704  AFWA15942274A1Q000B7189U799        82577DHR0002   481081160      M199617
DTAPE  AG877136704  AFWA15942274A1Q000B7189U799    *   82577DHR0002   481081169      M199017
FIRST  AG877241316  AFWA15943574A1Q000B7255U799    *   82577HPG034    481081160      M017917
DTAPE  AG877241316  AFWA15943574A1Q000B7255U799        82577HPG034    481081160      M017917
FIRST  AG877255252  AFWA15943574A1Q000B7255T799    *   82577GLY063    481081160      M087916
DTAPE  AG877255252  AFWA15943574A1Q000B7255T799        82577GLY063    481081160      M087916
FIRST  AG877255253  AFWA15943574A1Q000B7256U799    *   82577DHR0021   481081160      M198417
DTAPE  AG877255253  AFWA15943574A1Q000B7256U799        82577DHR0021   481081160      M198417
FIRST  AG877223373  AFWA15944174A1Q000B7256U799        82577HPG034    481081160      M018417
DTAPE  AG877223373  AFWA15944174A1Q000B7256U799    *   82577HPG034    481081160      M018417
FIRST  AG877254669  AFWA15961274A1Q000B7255R255    *   82577DHR0021   481081160      M098326
DTAPE  AG877254669  AFWA15961274A1Q000B7255R2557256A79982577DHR0021   481081160      M098326
FIRST  AF177214018  AFWA16037974A1Q000B7214T799    *   82577GLX0108   481081160      M031216
DTAPE  AF177214018  AFWA16037974A1Q000B7214T799        82577GLX0108   481081160      M031216
FIRST  AF177214019  AFWA16037974A1Q000B7214U799        82577HPG060    481081160      M013017
DTAPE  AF177214019  AFWA16037974A1Q000B7214U799    *   82577HPG060    481081160      M013017
FIRST  AF177220028  AFWA16037974A1Q000B7220R290    *   82577HPG060    481081160      M013826
DTAPE  AF177220028  AFWA16037974A1Q000B7220R2907221C16982577HPG060    481081160      M013826
FIRST  AF177220036  AFWA16038374A1Q000B7220T799        82577GLX0077   481081160      M062916
DTAPE  AF177220036  AFWA16038374A1Q000B7220T799    *   82577GLX0077   481081160      M062916
FIRST  AF177214023  AFWA16038574A1Q00HB7214R2907238C16982577GLX0099   481081160      M039426
DTAPE  AF177214023  AFWA16038574A1Q00HB7214R290    *   82577GLX0099   481081160      M039426
FIRST  AF177220034  AFWA16039874A1Q000B7220U799        82577GLX0077   481081160      M062917
DTAPE  AF177220034  AFWA16039874A1Q000B7220U799    *   82577GLX0077   481081160      M062917
FIRST  AF177214097  AFWA16040074A1Q000B7214U799    *   82577GLX0108   481081160      M030317
DTAPE  AF177214097  AFWA16040074A1Q000B7214U799        82577GLX0108   481081160      M030317
FIRST  AF177214098  AFWA16040074A1Q000B7214T799        82577HPG060    481081160      M013016
DTAPE  AF177214098  AFWA16040074A1Q000B7214T799    *   82577HPG060    481081160      M013016
```

```
                                      THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                               DATA RECORD
*****  ***************************************************************************************************

FIRST  AG877264159  AFWA159438 74A1U00HB7265R290    *   82577DHR0031    481560162      M018317
DTAPE  AG877264159  AFWA159438 74A1U00HB7265R2907265C12782577ENA0023    481039156      M128026
DTAPE  AG877264159  AFWA159438 74A1U00HB7265R290    *   82577ENA0023    481039156      M128026
DTAPE  AG877264159  AFWA159438 74A1U00HB7265R290    *   82577DHR0031    481560162      M018317
FIRST  AG877133657  AFWA159457 74A1U00HB7171R374    *   17863CSS114     8600700557     M076517
DTAPE  AG877133657  AFWA159457 74A1U00HB7171R3747135C12782577DXP0005    481039156      M152526
FIRST  AE277213136  AFWA160382 74A1U000B7214T799    *   82577DHR0032    481039156      M140616
DTAPE  AE277213136  AFWA160382 74A1U000B7214T799        82577DHR0032    481039156      M140616
FIRST  AG877216389  AFWA159441 74A1V00   7263U799   *   82577DHR0023    481083155      M285917
DTAPE  AG877216389  AFWA159441 74A1V00   7263U799       82577DHR0023    481083155      M285917
FIRST  AE277221080  AFWA160380 74A1W000B7221T799        82577GLX0080    481083155      M030016
DTAPE  AE277221080  AFWA160380 74A1W000B7221T799    *   82577GLX0080    481083155      M030016
FIRST  AF277217194  AFWA160384 74A1W000B7217R2907231C29082577ENA0004    481083155      M116326
DTAPE  AE277217194  AFWA160384 74A1W000B7217R290    *   82577ENA0004    481083155      M116326
FIRST  AE277217451  AFWA160401 74A1W000B7217T799        82577HPG058     481083155      M012916
DTAPE  AE277217451  AFWA160401 74A1W000B7217T799    *   82577HPG058     481083155      M012916
FIRST  AE277217452  AFWA160401 74A1W000B7221U799        82577GLX80      481083155      M030017
DTAPE  AE277217452  AFWA160401 74A1W000B7221U799    *   82577GLX80      481083155      M030017
FIRST  AG877243306  AFWA159435 74A1X000B7249U799    *   82577ENA0036    481010157      M154017
DTAPE  AG877243306  AFWA159435 74A1X000B7249U799        82577ENA0036    481010157      M154017
FIRST  AG877250320  AFWA159435 74A1X000B7250T799        82577DHR0038    481010157      M210716
DTAPE  AG877250320  AFWA159435 74A1X000B7250T799    *   82577DHR0038    481010157      M210716
FIRST  AG877250341  AFWA159435 74A1X000B7256U799        82577EWA0044    481010157      M126317
DTAPE  AG877250341  AFWA159435 74A1X000B7256U799    *   82577EWA0044    481010157      M126317
FIRST  AG776357225  AFWA159440 74A1X000B6358T799    *   94580GDA036     BG1049AB10     M116316
DTAPE  AG776357225  AFWA159440 74A1X000B6358T799        82577ENA0031    481010160      M098716
FIRST  AG877210370  AFWA159441 74A1X000B7249U799        82577ENA0029    481010157      M115917
DTAPE  AG877210370  AFWA159441 74A1X000B7249U799    *   82577ENA0029    481010157      M115917
```

```
                            THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                         DATA RECORD
*****  **************************************************************************************************************

FIRST  AG877242607  AFWA15945474A1X00DB7250R6957257C29082577DHR0027   481010157       M195626
DTAPE  AG877242607  AFWA15945474A1X00DA7250R695    *   82577DHR0027   481010157       M195626
FIRST  AG877244621  AFWA15945474A1X00DB7249R2427278C29082577DHR0040   481010157       M085226
DTAPE  AG877244621  AFWA15945474A1X00DB7249R242    *   82577DHR0040   481010157       M085226
FIRST  AB27711173081AAFWA15960974A1X70WB0000   7182429082577          31960484             31
DTAPF  AA27711173081AAFWA15960974A1X20WB0000   7131129082577          3196050              31
FIRST  AG7770090861AAFWA15984274A1X50HB7010R290    *   825772117      3196034         M109526
DTAPE  AG7770090861AAFWA15984274A1X50HB7010R2907010C127825772117      3196034         M109526
FIRST  AE1771431881AAFWA15901274A1170VB0000    0000000000000000000000000000000000000000000000
DTAPF  AC1771431881AAFWA15901274A1170WB0000    7159129082577          3322000              31
FIRST  AG877228008  AFWA15901874A1100DB7229R242    *   9383545032830005               A067216
DTAPF  AG877228008  AFWA15901874A1100DB7229R242        82577DHR0030   481001155       M187726
FIRST  AG777141268  AFWA15943674A1100DB7143R383    *   82577EWJ0022   481001155       M032026
DTAPE  AG777141268  AFWA15943674A1100DB7143R3837161C12744580CSS0090   BG1049AB10      M290526
FIRST  AG877019862  AFWA15945774A1100HD7027R123    *   82577DXP0040   481001155       M110226
DTAPF  AG877019862  AFWA15945774A1100HD7027R1237031C169471533194AK022900158647GR      A055026
FIRST  AE277216987  AFWA16039674A1100HB7217R242    *   82577HPG018    481001155       M022326
DTAPF  AE277216987  AFWA16039674A1100HB7217R2427220C12782577HPG018    481001155       M022326
FIRST  AE277214463  AFWA16040174A1100LD7216R242        82577HPG052    481001155       M014026
DTAPF  AE277214463  AFWA16040174A1100LD7216R242    *   82577HPG052    481001155       M014026
FIRST  AE277216494  AFWA16040174A1100GE7220R2907220C12782577HPG052    481001155       M014126
DTAPF  AE277216494  AFWA16040174A1100GE7220R290    *   82577HPG052    481001155       M014126
FIRST  AC177165163  AFWA15902574A1200HB7175R07071651290821 52075      0176000201      A065216
DTAPE  AC177165163  AFWA15902574A1200HB7175R070    *   82152148       0176000201      A065217
FIRST  AG777026061  AFWA15943374A1500HB7032R3817041C07082577GLX0022   481011160       M023426
DTAPF  AG777026061  AFWA15943374A1500HB7032R381    *   70210          AE97236E        A050626
FIRST  AG777075540  AFWA15944974A1700DB7081RC01    *   89305CSS173F   393033001       A073626
DTAPE  AG777075540  AFWA15944974A1700DB7081RC017083A79982577ENA0025   481013155       M062426
```

```
                                  THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                                DATA RECORD
*****   ***********************************************************************************************

FIRST   AC177242135  AFWA15863174A4B00HB7252R242     *   82577ENA0054    481031158      M129717
DTAPE   AC177242135  AFWA15863174A4B00HB7252R2427242C16082577DHR0033    481461160      M142326
FIRST   AG877259323  AFWA15944174A4B00HB7264R2907262C29082577DXP0005    481451155      M404626
DTAPE   AG877259323  AFWA15944174A4B00HB7264R290     *   82577DXP0005    481451155      M404626
FIRST   AA277264004  AFWA15902474A4E00HB0000     0000000000000000000000000000000000000000000
DTAPE   AB277264004  AFWA15902474A4E00HB0000     7336C29082577           481461160           31
FIRST   AB277113214  AFWA15942374A4F000B7115T799     *   82577ENA0055    481461160      M071917
DTAPE   AB277113214  AFWA15942374A4E000B7115T799         82577DHR9       481461160      M110716
FIRST   AG877243246  AFWA15943574A4F00HB7249R242     *   82577DHR0006    481461160      M198326
DTAPE   AG877243246  AFWA15943574A4E00HB7249R2427244A79982577DHR0006    481461160      M198326
FIRST   AE277216430  AFWA16039174A4E00DB7216R697     *   82577HPG31      481461160      M015226
DTAPE   AE277216430  AFWA16039174A4E000B7216R6977220C29082577HPG31      481461160      M015226
FIRST   AE277217381  AFWA16039074A4Z00DB7217R290     *   27963GLX0109    481452150      M060326
DTAPE   AE277217381  AFWA16039074A4Z00DB7217R2907217129027963GLX0109    481452150      M060326
FIRST   AC177242139  AFWA15862474A4200HB7242R2907242C44782577ENA0014    481452150      M292626
DTAPE   AC177242139  AFWA15862474A4200HB7242R290     *   37695EAM219     705471803      A000717
FIRST   AC177080135  AFWA15863774A42000B7081T799     *   82577GLX0015    481462155      M036416
DTAPE   AC177080135  AFWA19863774A42000B7081T799         27963ENA59      481452150      M059516
FIRST   AC177222136  AFWA15900874A42000B7237T799     *   94580           10041678105    A071117
DTAPE   AC177222136  AFWA15900874A42000B7237T799         27963DHR0026    481452150      M294216
FIRST   AG777092302  AFWA15945274A4200HB7093RC01     *   82577GLX0024    481001155      M037517
DTAPE   AG777092302  AFWA15945274A4200HB7093RC017094C70382577DHR0003    481452150      M238326
FIRST   AG877014845  AFWA15945774A42000B7014R2427016A79982577ENA0055    481452150      M128426
DTAPE   AG877014845  AFWA15945774A42000B7014R242     *   26055CSS731     352005002      A053926
FIRST   AC177222135  AFWA15959174A4200HB7222R291     *   945800          10041678105    A030016
DTAPE   AC177222135  AFWA15959174A4200HB7222R2917222124227963DXP0010    481452150      M188126
FIRST   AE277221391  AFWA16039074A42000B7221U799         82577GLX76      481452150      M032817
DTAPE   AE277221391  AFWA16039074A42000B7221U799     *   82577GLX76      481452150      M032817
```

```
                         THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                         DATA RECORD
*****  ****************************************************************************************************

FIRST  AE277217496  AFWA16040174A42000B7217T799         82577HPG046   481452150   M015816
DTAPE  AE277217496  AFWA16040174A42000B7217T799    *    82577HPG046   481452150   M015816
FIRST  AE277217497  AFWA16040174A42000B7217U799    *    27963GLX0019  481452150   M037417
DTAPE  AE277217497  AFWA16040174A42000B7217U799         27963GLX0019  481452150   M037417
FIRST  AE277221458  AFWA16040174A4200HB7221R290    *    27963GLX19    481452150   M037426
DTAPE  AE277221458  AFWA16040174A4200HB7221R2907222C64727963GLX19     481452150   M037426
FIRST  AG777164338  AFWA12943674A45000B7164U799    *    82577GLY0085  481031158   M030617
DTAPE  AG777164338  AFWA12943674A45000B7164U799         82577ENA0051  481462155   M046617
FIRST  AB277263096  AFWA15901374A45000B7263T799         82577DHR0024  481462155   M075916
DTAPE  AB277263096  AFWA15901374A45000B7263T799    *    82577DHR0024  481462155   M165916
FIRST  AG777164337  AFWA15943674A45000B7164T799         82577ENA0035  481462155   M143216
DTAPE  AG777164337  AFWA15943674A45000B7164T799    *    82577DHR0032  481031158   M204716
FIRST  AG777092301  AFWA15945274A4500HB7093RC017107C2908257DXP0015   481462155   M067026
DTAPE  AG777092301  AFWA15945274A4500HB7093RC01    *    82577ENA0040  481001155   M134816
FIRST  AC177067125  AFWA15960074A45000B7068T799    *    82577HPG030   481462155   M005817
DTAPE  AC177067125  AFWA15960074A45000B7068T799         82577DHR0018  481462155   M095416
FIRST  AB277241745  AFWA15961574A45000B7243T799         82577DHR0030  481560160   A066116
DTAPE  AB277241745  AFWA15961574A45000B7243T799    *    82577DXP027   481560160   A066117
FIRST  AC177223131  AFWA16038974A4500BB7270R957         82577DHR0018  481462155   M118426
DTAPE  AC177223131  AFWA16038974A4500BB7270R957    *    26512570      212488      A071117
FIRST  AE277221393  AFWA16039074A45000B7221U799    *    82577ENA0044  481462155   A000317
DTAPE  AE277221393  AFWA16039074A45000B7221U799         82577ENA0044  481462155   A000317
FIRST  AE277221459  AFWA16040174A4500HE7221R2907222C64782577HPG43     481462155   M015926
DTAPE  AE277221459  AFWA16040174A4500HE7221R290    *    82577HPG43    481462155   M015926
FIRST  AE177047014  AFWA15901674A4800HB7047R703         27963DHR0010  481451155   M179926
DTAPE  AC177047014  AFWA15901674A4800HB0000       707312428257 7      481451155        31
FIRST  AC176344953  AFWA15959474A4800HB6344R7056348A79927963EWJ0049   481451155   M041626
DTAPE  AC176344953  AFWA15959474A4800HB6344R705    *    13499CRE34    5222029003  A029426
```

```
                            THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78 .
SOURCE                                        DATA RECORD
*****  ************************************************************************************************************
FIRST  AG777137386  AFWA15960674A4800DB0000   000000000000000000000000000000000000000000000
DTAPE  AC177137386  AFWA15960674A4800DF7137RC03        82577DHR0039   481451155      M141526
FIRST  AF177222024  AFWA16038374A48000B7222T799    *   27963HPG001    481451155      M059416
DTAPE  AE177222024  AFWA16038374A48000B7222T799        27963HPG001    481451155      M059416
FIRST  AE177220025  AFWA16040074A4800HB7222R2907221C16027963DHR0025   481451155      M306576
DTAPE  AE177220025  AFWA16040074A4800HB7222R290    *   27963DHP0025   481451155      M306526
FIRST  AC177139178  AFWA15901174A5M000B7250T799        82577DHR0028   481541166      M134316
DTAPE  AC177139178  AFWA15901174A5M000B7250T799    *   98769476       3706699101     A064117
FIRST  AB277190065  AFWA15901574A5M000B7190T799        82577DHP0041   481541166      M154116
DTAPE  AB277190065  AFWA15901574A5M000B7190T799    *   82577DXP0024   481462155      M112016
FIRST  AG877241314  AFWA15943574A5M00HB7249R242    *   82577DHR0018   481541166      M092626
DTAPE  AG877241314  AFWA15943574A5M00HB7249R2427250C58382577DHP0018   481541166      M092626
FIRST  AG777236202  AFWA15943674A5M000B7250T799    *   97424FXP00836  8KF63AV2       M242617
DTAPE  AG777236202  AFWA15943674A5M000B7250T799        82577DHP0011   481541166      M266116
FIRST  AG877241321  AFWA15944174A5M00HB7249R2427243C28282577DHR0015   481541166      M205926
DTAPE  AG877241321  AFWA15944174A5M00HB7249R242    *   82577DHR0015   481541166      M205926
FIRST  AG877242260  AFWA15944274A5M000B7256U799    *   82577ENA0039   481541166      M136017
DTAPE  AG877242260  AFWA15944274A5M000B7256U799        82577FNA0039   481541166      M136017
FIRST  AG777228016  AFWA15959674A5M000B7228T799    *   94580CSS0072   BG1049AB09     M078217
DTAPE  AG777228016  AFWA15959674A5M000B7228T799        82577EWJ0014   481541166      M046316
FIRST  AF277210224  AFWA16038674A5M000B7280U799        82577HPG019    481541166      M018917
DTAPE  AF277210224  AFWA16038674A5M000B7280U799    *   94580HUR079    JG1073AB01     A011817
FIRST  AG877229449  AFWA59444474A5M00YB7229R374    *   70210CSS0013   94931251       M120226
DTAPE  AG877229449  AFWA59444474A5M00YB7229R374        82577DHR0020   481541166      M138626
FIRST  AB277119485  AFWA15958974A51000B7119T799        82577DXP0039   481501155      M137816
DTAPE  AB277119485  AFWA15958974A51000B7119T799    *                                      17
FIRST  AA277191963  AFWA15901974A52000B7204T799        82577DHR0010   481505155      M234216
DTAPE  AA277191963  AFWA15901974A52000B7204T799    *   846850000      HP11185031     A060117
```

```
                                     THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                                   DATA RECORD
*****  ******************************************************************************************************

FIRST  AB277255699  AFWA15960774A5200DB7262R3747290C73082577DXP0025   481505155   M120926
DTAPE  AB277255699  AFWA15960774A5200DB7262R374     *  83298GDA048    21817388    A060526
FIRST  AE277213342  AFWA16039774A5200DB7213R2907214C12782577HOG044    481505155   M025626
DTAPE  AE277213342  AFWA16039774A5200DB7213R290     *  82577HOG044    481505155   M025626
FIRST  AA276296920  AFWA15902474A5300DB6296U799     *  82577DHR0023   481541166   M247017
DTAPE  AA276296920  AFWA15902474A5300DB6296U799        82577DHR0022   481580166   M246016
FIRST  AG877243243  AFWA15943574A5400DB7249U799        82577ENA0048   481560168   M181717
DTAPE  AG877243243  AFWA15943574A5400DB7249U799     *  82577ENA0048   481560168   M181717
FIRST  AG877265293  AFWA15943574A5400HB7265R2427299C29082577ENA0044   481560160   A056526
DTAPE  AG877265293  AFWA15943574A5400HB7265R242     *  82577ENA0044   481560160   A056526
FIRST  AG877264158  AFWA15944174A5400DB7264T799     *  32577DHR0030   481560162   M018416
DTAPE  AG877264158  AFWA15944174A5400DB7264T799        32577DHR0030   481560162   M018416
FIRST  AF277220442  AFWA16039174A5400DB7221R135     *  82577GLX68     48150160    A003726
DTAPE  AE277220442  AFWA16039174A5400DB7221R1357223C07082577GLX68     48150160    A003726
FIRST  AB277003166  AFWA15901574A5500YB7003RC01     *  82577GLX0028   481580168   M036826
DTAPE  AB277003166  AFWA15901574A5500YB7003RC017004A79982577GLX0028   481580168   M036826
FIRST  AB277003167  AFWA15942674A5500DB7003T799        82577EWJ0038   481580168   M067116
DTAPE  AB277003167  AFWA15942674A5500DB7003T799     *  82577EWJ0038   481580168   M067116
FIRST  AB277003168  AFWA15942674A5500DB7004U799        82577GLX0028   481580168   M037117
DTAPE  AB277003168  AFWA15942674A5500DB7004U799     *  82577GLX0028   481580168   M037117
FIRST  AG877243258  AFWA15943574A5500HB7249R242     *  82577DHR0004   481580168   M113626
DTAPE  AG877243258  AFWA15943574A5500HB7249R2427244C07082577DHR0004   481580168   M113626
FIRST  AG771107397IBAFWA15944174A5540VB0000    0000000000000000000000000000000000000000000000
DTAPE  AG8771073971BAFWA15944174A5540WB8017L9580000000000000000000000000000000000000000000000
FIRST  AG777255238  AFWA15945374A5500DB7258T799        82577ENA0053   481580168   M124016
DTAPE  AG777255238  AFWA15945374A5500DB7258T799     *  82577DXP0001   481580168   M123217
FIRST  AG877107835  AFWA15945774A5500DB7113U799        82577ENA0038   481580168   M092817
DTAPE  AG877107835  AFWA15945774A5500DB7113U799     *  7303CFL46079   FD749200    E004917
```

```
                              THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                             DATA RECORD
*****  ***************************************************************************************************
FIRST  AC177136384  AFWA15960674A5500DF7136R692          82577DXP0035   481580168      M150626
DTAPE  AG777136384  AFWA15960674A5500DB000Q0     7138C25582577           481580168           31
FIRST  AE177221048  AFWA16038374A5500   7221T799    *   82577GLX0062   481580168      M043116
DTAPE  AE177221048  AFWA16038374A5500   7221T799        82577GLX0062   481580168      M043116
FIRST  AE177221037  AFWA16038574A5500DB7221R957    *   82577DHR0041   481580168      M174026
DTAPE  AE177221037  AFWA16038574A5500DB7221R9577229C958825770HR0041   481580168      M174026
FIRST  AG877241243  AFWA15943574A61000B7249U799    *   82577ENA0028   481601151      M161717
DTAPE  AG877241243  AFWA15943574A61000B7249U799        82577ENA0028   481601151      M161717
FIRST  AG777113309  AFWA15945274A6100HB7123RC01    *   82577DXP0002   481601151      M121216
DTAPF  AG777113309  AFWA15945274A6100HB7123RC017138L16982577FNA0043   481601151      M088126
FIRST  AE277214065  AFWA16038074A6100AB7216R2907216C16982577HPG004    481601151      M038926
DTAPF  AE277214065  AFWA16038074A6100AB7216R290    *   82577HPG004    481601151      M038926
FIRST  AA276288958  AFWA15902474A62000B6288T799    *   82577DXP0023   481014155      M052816
DTAPF  AA276288958  AFWA15902474A62000B6288T799        82577FNA0001   481610156      M094116
FIRST  AG777056058  AFWA15943374A62000B7056T799    *   82340RU022     A51K560007     A051917
DTAPE  AG777056058  AFWA15943374A62000B7056T799        82577DXP0043   481610150      M122416
FIRST  AG877261327  AFWA15944174A6200HB7261T799        82577ENA0032   481610150      M152416
DTAPE  AG877261327  AFWA15944174A6200HB7261T799    *   82577ENA0032   481610150      M152416
FIRST  AG877261328  AFWA15944174A6200   7263U799        82577DHR0034   481610150      M206717
DTAPF  AG877261328  AFWA15944174A6200   7263U799    *   82577DHR0034   481610150      M206717
FIRST  AG877259207  AFWA15944274A6200DB7264R242        82577ENA0041   481610150      M162426
DTAPE  AG877259207  AFWA15944274A6200DB7264R242    *   82577ENA0041   481610150      M162426
FIRST  AG777034592A AFWA15945374A6230WB0000      000000000000000000000000000000000000000000000
DTAPE  AG877034592A AFWA15945374A6230WB0000      7080C28282577           32259351       .    31
FIRST  AG877260415  AFWA15959874A6200BB7261R2427262A79982577DHR0019   48161015       M148126
DTAPF  AG877260415  AFWA15959874A6200BB7261R242    *   82577DHR0019   48161015       M148126
FIRST  AG877250318  AFWA15943574A74000B7250T799        82577DHR0002   481710160      M121316
DTAPF  AG877250318  AFWA15943574A74000B7250T799    *   82577DHR0002   481710160      M121316
```

```
                            THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                         DATA RECORD
*****  *******************************************************************************************

FIRST  AG877250319  AFWA15943574A74000B7256U799           82577DHR0019   481710160      M126117
DTAPE  AG877250319  AFWA15943574A74000B7256U799     *     82577DHR0019   481710160      M126117
FIRST  AG877256125  AFWA15943874A7400HB7258R242     *     82577DHP0025   481710165      M082626
DTAPE  AG877256125  AFWA15943874A7400HB7258R2427257A79982577DHR0025   481710165      M082626
FIRST  AG7763149571FAFWA15944374A74ROWB           000000000000000000000000000000000000000000000
DTAPE  AG8763149571FAFWA15944374A74ROWB           7097C29082577          3201493                31
FIRST  AG877250658  AFWA15945474A74000B7250R290     *     82577DHR0019   481710160      M125826
DTAPE  AG877250658  AFWA15945474A74000B7250R2907253C29082577DHR0019   481710160      M125826
FIRST  AC176337194  AFWA15960074A74000B6357U799     *     82577DXP0023   481710160      M133917
DTAPE  AC176337194  AFWA15960074A74000B6357U799           82577DHR003    481461160      M154216
FIRST  AE277271231  AFWA16038674A74000B7326R290     *     265120025      A51H200783     A012017
DTAPE  AE277271231  AFWA16038674A74000B7326R2907272C29082577PHG020    481710160      M021226
FIRST  AG877264021  AFWA15960474P5400DB7264R290           82577ENA0038   481560162      M100926
DTAPE  AG877264021  AFWA15960474P5400DB7264R290     *     82577ENA0038   481560162      M100926
FIRST  AA277237920  AFWA15959374R12000B7243T799     *     49671DN274     8553526        A063917
DTAPE  AA277237920  AFWA15959374R12000B7243T799           26512          A51A1010221    A084116
FIRST  AB277005298  AFWA15960174R1200HB7005R374     *     26512000       A51A1010221    A003426
DTAPE  AB277005298  AFWA15960174R1200HB7005R3747102445026512000       A51A1010221    A003426
FIRST  AB277005299  AFWA15961574R1200  7005T799           26512000       A51A1010221    A035616
DTAPE  AB277005299  AFWA15961574R1200  7005T799     *     26512000       A51A1010221    A035616
FIRST  AG777260294  AFWA15943674X1X000B7264P799     *     13499DGA635    7771388001     A033617
DTAPE  AG777260294  AFWA15943674X1X000B7264P799           92220GRU050    69881000       C032416
FIRST  AG877214407  AFWA15944174X1X000B7250R242           92200CSS130    A51A90219      A061526
DTAPE  AG977214407  AFWA15944174X1X000B7250R242     *     92200CSS130    A51A90219      A061526
FIRST  AC177069175  AFWA15960674X1X000B7069R290     *     24384DCN12035  40234000503    M000116
DTAPE  AC177069175  AFWA15960674X1X000B7069R290           92220GRV008    69881000       A032726
FIRST  AC177124378  AFWA15960674X1X00HB7147A79900000000000000000000000000000000000000000000
DTAPE  AG777124378  AFWA15960674X1X00HB0000       71311170792201         69881000               31
```

```
                               THE FOLLOWING RECORDS ARE DUPLICATED  PROGRAM NO 2A   DATE  09/29/78
SOURCE                                      DATA RECORD
*****  ***************************************************************************************************

FIRST  AGB77216253  AFWA15943574Y1M000B7263U799      *   99479JFL004     A51A90331       A058217
DIAPE  AGB77216253  AFWA15943574Y1M000B7263U799          99479JFL004     A51A90331       A058217
FIRST  AGB77207375  AFWA15944174Y1M000B7260U799      *   99479000        DC3766          A061517
DIAPF  AGB77207375  AFWA15944174Y1M000B7260U799          99479000        DC3766          A061517
FIRST  AB276283254  AFWA159426743D1000B6343U7996355C29086360GRV052       755300000008    M023726
DIAPE  AB276283254  AFWA159426743D1000B6343U799      *   86360GDA45      755300000008    M023717
FIRST  AGB77206355  AFWA159441743D1000B7264U799      *   86360CSS0041    755300000008    M040717
DIAPE  AGB77206355  AFWA159441743D1000B7264U799          86360CSS0041    755300000008    M040717
FIRST  AC177026121  AFWA159596743D1000B8025R9587049429086360CSS149       755300000008    M165726
DIAPF  AC177026121  AFWA159596743D1000B8025R958      *   045771758       21920019        A017716
FIRST  AE177221023  AFWA160383743D1000B7221T799      *   86360HGE021     755300000008    M063016
DIAPF  AE177221023  AFWA160383743D1000B7221T799          86360HGF021     755300000008    M063016
FIRST  AE177196168  AFWA160398743D1000B7221R2907259C29086360HGF018       755300000008    M049426
DIAPF  AE177196168  AFWA160398743D1000B7221R290      *   86360HGF018     755300000008    M049426
FIRST  AB276283249  AFWA159013743D2000B6343U799630 7D290                                 000026
DIAPE  AB276283249  AFWA159013743D2000B6343U799      *   86360GDA034     7551000000      M135517
FIRST  AA276292906  AFWA159014743D2000B6292T799      *   86360CSS080     755100000018    M074916
DIAPE  AA276292906  AFWA159014743D2000B6292T799          86360CSS080     755100000018    M074916
FIRST  AB277180051  AFWA159015743D2000B7229T799      *   86360CSS069     755100000018    M247817
DIAPF  AB277180051  AFWA159015743D2000B7229T7997223C29086360CSS094       755100000018    M275916
FIRST  AGB77259628  AFWA159454743D2000B7260R2427263C29086360CSS094       75510000018     M047826
DIAPE  AGB77259628  AFWA159454743D2000B7260R242      *   86360CSS094     75510000018     M047826
```

```
TOTALS FOR PROGRAM NO 2A                                         DATE  09/29/78
-------------------------------------------------------------------------------

*****************************************************************************
*                 *       DTAPE       *       ETAPE       *       PTAPE     *
*****************************************************************************
* NUMBER OF       *                   *                   *                 *
* RECORDS         *       88281       *       12600       *       12600     *
* READ IN         *                   *                   *                 *
*****************************************************************************
* SELECTED        *                   *                   *                 *
* WU-CODE         *       13317       *                   *                 *
* RECORDS         *                   *                   *                 *
*****************************************************************************
* NUMBER OF       *                   *                   *                 *
* DUPLICATE       *         166       *                   *                 *
* RECORDS         *                   *                   *                 *
*****************************************************************************
*****************************************************************************
* ERRORS          *         551       *                   *                 *
*****************************************************************************
* WU-CODE SPACE   *          70       *                   *                 *
*****************************************************************************
* JCN-DAT ALPHA   *                   *                   *                 *
*****************************************************************************
* SEQ ALPHA       *          29       *                   *                 *
*****************************************************************************
* ML1-DAT ALPHA   *                   *                   *                 *
*****************************************************************************
* METER ALPHA     *           5       *                   *                 *
*****************************************************************************
* ML1 LT JCN      *           1       *                   *                 *
*****************************************************************************
* ML2-DAT ALPHA   *          78       *                   *                 *
*****************************************************************************
* ML2 LT ML1      *         368       *                   *                 *
*****************************************************************************
* MMH1 ALPHA      *                   *                   *                 *
*****************************************************************************
* MMH2 ALPHA      *                   *                   *                 *
*****************************************************************************
* NORMU ALPHA     *                   *                   *                 *
*****************************************************************************
* NORS ALPHA      *                   *                   *                 *
*****************************************************************************
* AWM ALPHA       *                   *                   *                 *
*****************************************************************************
* MERGED RECDS    *                   *                   *       12600     *
*****************************************************************************
```

```
 CBL SXREF,STATE,QUOTE,CLIST,FLOW
              IDENTIFICATION DIVISION.
              PROGRAM-ID. MRG2A.
              AUTHOR.  TONY GIRGENTI , ISI.
              ENVIRONMENT DIVISION.
              CONFIGURATION SECTION.
              SOURCE-COMPUTER. IBM-370.
              OBJECT-COMPUTER. IBM-370.
              INPUT-OUTPUT SECTION.
              FILE-CONTROL.
                  SELECT CRD-RDR ASSIGN TO SYS007-UR-1442R-S.
                  SELECT D-TAPE  ASSIGN TO SYS023-DA-3340-S
                         ACCESS MODE IS SEQUENTIAL.
                  SELECT E-TAPE  ASSIGN TO SYS024-DA-3340-S
                         ACCESS MODE IS SEQUENTIAL.
                  SELECT P-TAPE  ASSIGN TO SYS025-DA-3340-S
                         ACCESS MODE IS SEQUENTIAL.
                  SELECT  JB-JBW ASSIGN TO SYS015-DA-3340-I
                         ACCESS MODE IS SEQUENTIAL
                         RECORD KEY IS JB-KEY.
                  SELECT  PRT-MSG ASSIGN TO SYS008-UR-3203-S.
              DATA DIVISION.
            / FILE SECTION.
              FD  CRD-RDR LABEL RECORD IS OMITTED
                         RECORDING MODE IS F
                         RECORD CONTAINS 80  CHARACTERS.
              01  CRD-RECORD.
                  05  CRD-FIELD OCCURS 13 TIMES.
                      10  CRD-WU  PICTURE IS X(5).
                      10  CRD-SPACER PICTURE IS X.
                  05  FILLER         PICTURE IS XX.
              01  CRD-FIRST REDEFINES CRD-RECORD.
                      10  CRD-TWO-DIGIT   PICTURE IS XX.
                      10  CRD-BLANKS      PICTURE IS X(3).
                      10  CRD-REST        PICTURE IS X(75).
              FD  D-TAPE  LABEL RECORD IS STANDARD
                         RFCORDING MODE IS F
                         BLOCK CONTAINS 90  RECORDS
                         RECORD CONTAINS 85 CHARACTERS.
              01  D-RECORD.
                  05  D-ORG-CODE                PICTURE IS XXX.
                  05  D-JCN-DATE                PICTURE IS X(5).
                  05  D-JCN-DATF-CHK REDEFINES D-JCN-DATE.
                      10  D-JCN-DECADE          PIC 9.
                      10  D-JCN-YR              PIC X.
                      10  D-JCN-DAY             PIC XXX.
                  05  D-JCN-SEQ                 PICTURE IS XXX.
                  05  D-JCN-SUF                 PICTURE IS XX.
                  05  D-TE-CODE                 PICTURE IS XXXX.
                  05  D-BUR-NO                  PICTURE IS X(6).
                  05  D-WU-CODE.
                      10  D-TWO-DIGIT-WU        PICTURE IS XX.
                      10  D-REST-OF-WU          PICTURE IS X(5).
                  05  D-WU-CODES REDEFINES D-WU-CODE.
                      10  D-FIVE-DIGIT-WU       PICTURE IS X(5).
                      10  D-2LEFT               PICTURE IS XX.
                  05  FILLER                    PICTURE IS XX.
                  05  D-ML1-DATE                PICTURE IS XXXX.
                  05  D-ML1-DATE-CHK REDEFINES D-ML1-DATE.
                      10  D-ML1-YR              PIC X.
                      10  D-ML1-DAY             PIC XXX.
                  05  D-ATC1                    PICTURE IS X.
                  05  D-HMC1                    PICTURE IS XXX.
                  05  D-ML2-DATE                PICTURE IS 9999.
                  05  D-ML2-DATE-CHK REDEFINES D-ML2-DATE.
                      10  D-ML2-YR              PIC X.
                      10  D-ML2-DAY             PIC XXX.
                  05  D-ATC2                    PICTURE IS X.
                  05  D-HMC2                    PICTURE IS XXX.
                  05  FILLER                    PICTURE IS X(5).
                  05  D-SERIAL                  PICTURE IS X(10).
                  05  FILLER                    PICTURE IS X(16).
                  05  D-METER                   PICTURE IS XXXX.
                  05  FILLER                    PIC XX.
              FD  E-TAPE  LABEL RECORD IS STANDARD
                         BLOCK CONTAINS 60  RECORDS
                         RECORD CONTAINS 126 CHARACTERS.
```

```
       01  E-RECORD.
           05  E-ORG-CODE                PICTURE IS XXX.
           05  E-JCN-DATE                PICTURE IS X(5).
           05  E=JCN=SEQ                 PICTURE IS XXX.
           05  E-JCN-SUF                 PICTURE IS XX.
           05  E-TE-CODE                 PICTURE IS XXXX.
           05  E-BUR-NO                  PICTURE IS X(6).
           05  E=WU=CODE.
               10  E-TWO-DIGIT-WU        PICTURE IS XX.
               10  E-REST-OF-WU          PICTURE IS X(5).
           05  E-WU-CODES REDEFFINES E-WU-CODE.
               10  E-FIVE-DIGIT-WU       PICTURE IS X(5).
               10  E-2LEFT               PICTURE IS XX.
           05  FILLER                    PICTURE IS X(6).
           05  E-MMH1                    PICTURE IS X(5).
           05  E=FMT1                    PICTURE IS X(5).
           05  FILLER                    PICTURE IS X(7).
           05  E-MMH2                    PICTURE IS X(5).
           05  E-EMT2                    PICTURE IS X(5).
           05  FILLER                    PICTURE IS X(63).
       FD  P-TAPE  LABEL RECORD IS STANDARD
                   RECORDING MODE IS F
                   BLOCK CONTAINS 60  RECORDS
                   RECORD CONTAINS 134 CHARACTERS.
       01  P-RECORD.
           05  FILLER                    PICTURE IS XXX.
           05  P-JCN-DATE                PICTURE IS X(5).
           05  P-JCN-SEQ                 PICTURE IS XXX.
           05  P-JCN-SUF                 PICTURE IS XX.
           05  FILLER                    PICTURE IS XXXX.
           05  P-BUR-NO                  PICTURE IS X(6).
           05  P=WU=CODE.
               10  P-TWO-DIGIT-WU        PICTURE IS XX.
               10  P-REST-OF-WU          PICTURE IS X(5).
           05  P-WU-CODES REDEFINES P-WU-CODE.
               10  P-FIVE=DIGIT-WU       PICTURE IS X(5).
               10  P-2LEFT               PICTURE IS XX.
           05  FILLER                    PICTURE IS X(28).
           05  P-NORMU-TIME              PICTURE IS X(5).
           05  P-NORS=TIME               PICTURE IS X(5).
           05  P-AWM         OCCURS 7 TIMES PICTURE IS 9999.
           05  FILLER                    PICTURE IS X(38).
       FD  JB-JBW        LABEL RECORD IS STANDARD
    /              RECORDING MODE IS F
                         BLOCK CONTAINS 70  RECORDS
                         RECORD CONTAINS 112 CHARACTERS.
       01  MERGED-RECORD.
           05  DEP-MERGED.
               10  JB-KEY.
                   15  JB-BUR-NO   PICTURE IS X(6).
                   15  JB-JCN-DATE PICTURE IS X(5).
                   15  JB-JCN-SEQ  PICTURE IS XXX.
                   15  JB-JCN-SUF  PICTURE IS XX.
               10  FILLER          PICTURE IS X.
               10  JB-TE-CODE      PICTURE IS XXXX.
               10  FILLEB          PICTURE IS X.
               10  JB-WU-CODE      PICTURE IS X(5).
               10  FILLER          PICTURE IS X.
               10  JB-SER-NO       PICTURE IS X(10).
               10  FILLER          PICTURE IS X.
               10  JB-ORG-CODE     PICTURE IS XXX.
               10  FILLER          PICTURE IS X.
               10  JB-ML1-DATE           PIC XXXXX.
               10  JB-ML1-DATE-CHK REDEFINES JB-ML1-DATE.
                   15  JB-ML1-DECADE     PIC 9.
                   15  JB-ML1-YR         PIC X.
                   15  JB-ML1-DAY        PIC XXX.
               10  FILLEB          PICTURE IS X.
               10  JB-ML2-DATE           PIC XXXXX.
               10  JB-ML2-DATE-CHK REDEFFINES JB-ML2-DATE.
                   15  JB-ML2-DECADE     PIC 9.
                   15  JB-ML2-YR         PIC X.
                   15  JB-ML2-DAY        PIC XXX.
               10  FILLER          PICTURE IS X.
               10  JB-ATC1         PICTURE IS X.
               10  FILLER          PICTURE IS X.
               10  JB-ATC2         PICTURE IS X.
```

```
00154                  10  FILLER          PICTURE IS X.
00155                  10  JB-HMC1         PICTURE IS XXX.
00156                  10  FILLER          PICTURE IS X.
00157                  10  JB=HMC2         PICTURE IS XXX.
00158                  10  FILLER          PICTURE IS X.
00159                  10  JB-METER        PICTURE IS XXXX.
00160                  10  FILLER          PICTURE IS X.
00161              05  P-MERGED.
00162                  10  JB-EMI1         PICTURE IS X(5).
00163                  10  FILLER          PICTURE IS X.
00164                  10  JB-EMI2         PICTURE IS X(5).
00165                  10  FILLER          PICTURE IS X.
00166                  10  JB-MMI11        PICTURE IS X(5).
00167                  10  FILLER          PICTURE IS X.
00168                  10  JB-MMI12        PICTURE IS X(5).
00169                  10  FILLFR          PICTURE IS X.
00170                  10  JB-NORMU-TIME   PICTURE IS X(5).
00171                  10  FILLER          PICTURE IS X.
00172                  10  JB-NORS-TIMF    PICTURE IS X(5).
00173                  10  FILLER          PICTURE IS X.
00174                  10  JB-AWM-TIME     PICTURE IS 9999.
00175          FD  PRT-MSG         LABEL RECORD IS OMITTED
00176                              RECORDING MODE IS F
00177                              RECORD CONTAINS 132 CHARACTERS.
00178          01  DUP-RECORD.
00179              05  DUP-MSG.
00180                  10  FILLER          PICTURE IS X(33).
00181                  10  DUP-HDR         PICTURE IS X(60).
00182                  10  DUP-DATE        PICTURE IS X(8).
00183                  10  FILLFR          PICTURE IS X(31).
00184          01  DUP-TAPE-RECORD REDEFINES DUP-RECORD.
00185                  10  FILLER          PICTURE IS X(5).
00186                  10  DUP-ASTR        PICTURE IS X(5).
00187                  10  FILLFR          PICTURE IS XX.
00188                  10  DUP-REC         PICTURE IS X(110).
00189                  10  FILLER          PICTURE IS X(10).
00190          01  DUP-TOTAL-PPINT REDEFINES DUP-TAPE-RECORD.
00191                  10  FILLER                      PIC X(33).
00192                  10  DUPT-HDR                    PIC X(68).
00193                  10  FILLER                      PIC X(31).
00194          01  DUP-TOTALS REDEFINES DUP-TOTAL-PRINT.
00195                  10  FILLER                      PIC X(54).
00196                  10  DUP-TOTD                    PIC Z(6).
00197                  10  FILLER                      PIC X(10).
00198                  10  DUP-TOTE                    PIC Z(6).
00199                  10  FILLER                      PIC X(10).
00200                  10  DUP-TOTP                    PIC Z(6).
00201                  10  FILLER                      PIC X(40).
00202          WORKING-STORAGE SECTION.
00203          77  FIRST-ONE                           PIC 9 VALUE ZERO.
00204          77  RECORD-CTR                          PIC 999.
00205          77  TALLY-SAVE                          PIC 99.
00206          77  TEST-IT                         PICTURE IS 999.
00207          77  PRT-CTR                             PIC 99.
00208          77  DCTR                                PIC 9(6) VALUE ZEROS.
00209          77  ECTR                                PIC 9(6) VALUE ZEROS.
00210          77  PCTR                                PIC 9(6) VALUE ZEROS.
00211          77  DDCTR                               PIC 9(6) VALUE ZEROS.
00212          77  EDCTR                               PIC 9(6) VALUE ZEROS.
00213          77  PDCTR                               PIC 9(6) VALUE ZEROS.
00214          77  CRD-SUB         PICTURE IS 99.
00215          77  WU-SUB          PICTURF IS 999.
00216          77  TOTAL-WU-CODES                      PIC 999.
00217          77  INDX1                               PIC 999.
00218          77  INDX2                               PIC 999.
00219          77  INDX2A                              PIC 999.
00220          77  INDX3                               PIC 999.
00221          77  INDX4                               PIC 999.
00222          77  TWO-DIGIT-WU      PICTURE IS XX.
00223          77  PRO-SW          PICTURE IS 9.
00224          77  FILE-TYPE       PICTURE IS 9.
00225          77  DCTR1                               PIC 9(6) VALUE ZEROS.
00226          77  DCTR2                               PIC 9(6) VALUE ZEROS.
00227          77  DCTR3                               PIC 9(6) VALUE ZEROS.
00228          77  DCTR4                               PIC 9(6) VALUE ZEROS.
00229          77  DCTR5                               PIC 9(6) VALUE ZEROS.
00230          77  DCTR6                               PIC 9(6) VALUE ZEROS.
```

```
77  DCTR7                           PIC 9(6) VALUE ZEROS.
77  DCTR8                           PIC 9(6) VALUE ZEROS.
77  DCTR9                           PIC 9(6) VALUE ZEROS.
77  DCTR10                          PIC 9(6) VALUE ZEROS.
77  ECTR1                           PIC 9(6) VALUE ZEROS.
77  ECTR2                           PIC 9(6) VALUE ZEROS.
77  ECTR3                           PIC 9(6) VALUE ZEROS.
77  PCTR1                           PIC 9(5) VALUE ZEROS.
77  PCTR2                           PIC 9(6) VALUE ZEROS.
77  PCTR3                           PIC 9(6) VALUE ZEROS.
77  HDR-MSG         PICTURE IS X(60) VALUE IS  THE FOLLOWING RECORDS
-               ARE DUPLICATED  PROGRAM NO 2A   DATE   .
77  HDR1    PIC X(68) VALUE  ************************************
-           ******************************** .
77  HDR2    PIC X(68) VALUE  *               *     DTAPE     *
-             ETAPE     *     PTAPE        * .
77  HDR3    PIC X(68) VALUE  * NUMBER OF     *               *
-                       *                  * .
77  HDR4    PIC X(68) VALUE  * RECORDS       *               *
-                       *                  * .
77  HDR5    PIC X(68) VALUE  * READ IN       *               *
-                       *                  * .
77  HDR6    PIC X(68) VALUE  * DUPLICATE     *               *
-                       *                  * .
77  HDR7    PIC X(68) VALUE  * RECORDS USED  *               *
-                       *                  * .
77  HDR8    PIC X(68) VALUE  * IN MERGE      *               *
-                       *                  * .
77  HDR9    PIC X(60) VALUE  TOTALS FOR PROGRAM NO 2A
-                             DATE   .
77  HDR10   PIC X(69) VALUE       SOURCE
-                           DATA RECORD  .    .
77  HDR11   PIC X(68) VALUE  * ERRORS        *               *
-                       *                  * .
77  HDR12   PIC X(68) VALUE  * WU-CODE SPACE *               *
-                       *                  * .
77  HDR13   PIC X(68) VALUE  * JCN-DAT ALPHA *               *
-                       *                  * .
77  HDR14   PIC X(68) VALUE  * ML1-DAT ALPHA *               *
-                       *                  * .
77  HDR15   PIC X(68) VALUE  * ML2-DAT ALPHA *               *
-                       *                  * .
77  HDR16   PIC X(68) VALUE  * METER ALPHA   *               *
-                       *                  * .
77  HDR17   PIC X(68) VALUE  * ML1 LT JCN    *               *
-                       *                  * .
77  HDR18   PIC X(68) VALUE  * ML2 LT ML1    *               *
-                       *                  * .
77  HDR19   PIC X(68) VALUE  * MMH1 ALPHA    *               *
-                       *                  * .
77  HDR20   PIC X(68) VALUE  * MMH2 ALPHA    *               *
-                       *                  * .
77  HDR21   PIC X(68) VALUE  * NORMU ALPHA   *               *
-                       *                  * .
77  HDR22   PIC X(68) VALUE  * NORS ALPHA    *               *
-                       *                  * .
77  HDR23   PIC X(68) VALUE  * AWM ALPHA     *               *
-                       *                  * .
77  HDR24   PIC X(68) VALUE  * SEQ ALPHA     *               *
-                       *                  * .
77  HDR25   PIC X(68) VALUE  * SELECTED      *               *
-                       *                  * .
77  HDR26   PIC X(68) VALUE  * WU-CODE       *               *
-                       *                  * .
77  HDR27   PIC X(68) VALUE  * RECORDS       *               *
-                       *                  * .
77  HDR28   PIC X(68) VALUE  NO MATCH FOR THE FOLLOWING DRECORD .
77  HDR29   PIC X(68) VALUE  * MERGED RECDS  *               *
-                       *                  * .
77  TEST-MSG        PICTURE IS X(44) VALUE IS  ***** HOW MANY UNBYPAS
-                SED RECORDS FOR TEST   .
01  FIVE-DIGIT-WU-TABLE.
    05  WU-CODE OCCURS  500 TIMES PICTURE IS X(5).
01  PREV-D-RECORD.
    05  FILLER              PICTURE IS XXX.
    05  PREV-D-JCN-DATE     PICTURE IS X(5).
    05  PREV-D-JCN-SEQ      PICTURE IS XXX.
    05  PREV-D-JCN-SUF          PICTURE IS XX.
    05  FILLER                  PICTURE IS XXXX.
    05  PRFV-D-BUR-NO           PICTURE IS X(6).
    05  EILLER                  PICTURE IS X(62).
01  D-SFQ.
    05  DS-WU-CODE                  PIC X(5) VALUE SPACES.
    05  DS-BUR-NO                   PIC X(6) VALUE SPACES.
    05  DS-JCN-DATE                 PIC X(5) VALUE SPACES.
    05  DS-JCN-SEQ                  PIC XXX VALUE SPACES.
    05  DS-JCN-SUF                  PIC XX VALUE SPACES.
01  E-SEQ.
    05  ES-WU-CODE                  PIC X(5) VALUE SPACES.
    05  ES-BUR-NO                   PIC X(6) VALUE SPACES.
    05  ES-JCN-DATE                 PIC X(5) VALUE SPACES.
    05  ES-JCN-SEQ                  PIC XXX VALUE SPACES.
    05  ES-JCN-SUF                  PIC XX VALUE SPACES.
01  P-SEQ.
    05  PS-WU-CODE                  PIC X(5) VALUE SPACES.
    05  PS-BUR-NO                   PIC X(6) VALUE SPACES.
    05  PS=JCN-DATE                 PIC X(5) VALUE SPACES.
    05  PS-JCN-SEQ                  PIC XXX VALUE SPACES.
    05  PS-JCN-SUF                  PIC XX VALUE SPACES.
PROCEDURE DIVISION.
            MOVE 1 TO WU-SUB.
            MOVE ZEROS TO PREV-D-RECORD.
            MOVE 28 TO PRT-CTR.
            OPEN INPUT CRD-RDR.
READ=A-CARD.
            MOVE SPACES TO CRD-RECORD.
            MOVE 1 TO CRD-SUB.
    READ CRD-RDR RECORD AT END GO TO OPEN-TAPE-FILES.
    IF CRD-BLANKS IS NOT EQUAL TO SPACES
        GO TO FIVE-DIGIT-TABLE-SETUP.
            MOVE CRD-TWO-DIGIT TO TWO-DIGIT-WU.
            ADD 1 TO CRD-SUB.
FIVE=DIGIT=TABLE-SETUP.
    IF  CRD-WU (CRD-SUB) EQUAL  SPACES
        GO TO READ-A-CARD.
            MOVE CRD-WU (CRD-SUB) TO WU-CODE (WU-SUB).
            ADD 1 TO CRD-SUB.
            ADD 1 TO WU-SUB.
    IF  CRD-SUB IS GREATER THAN 13
        GO TO READ-A-CARD.
            GO TO FIVE-DIGIT-TABLE-SETUP.
OPEN-TAPE-FILES.
            SUBTRACT 1 FROM WU-SUB.
            MOVE WU-SUB TO INDX3, TOTAL-WU-CODES.
    OPEN INPUT D-TAPE.
    OPEN INPUT E-TAPE.
    OPEN INPUT P-TAPE.
        OPEN OUTPUT PRT-MSG
        OPEN OUTPUT JB=JBW.
            CLOSE CRD-RDR.
            MOVE ZEROS TO RECORD-CTR.
            MOVE ZFRO TO PRO-SW.
READ-D-TAPE.
            MOVE 1 TO WU-SUB.
            MOVE SPACES TO D-RECORD, MERGED-RECORD.
    READ D-TAPE RECORD AT END
        GO TO CLOSE-OUT.
            ADD 1 TO DCTR.
            MOVE D-BUR-NO        TO DS-BUR-NO.
            MOVE D-JCN-DATE      TO DS-JCN-DATE.
            MOVE D-JCN-SEQ       TO DS-JCN-SEQ.
            MOVE D-JCN-SUF       TO DS-JCN-SUF.
    IF  D-TWO-DIGIT-WU = TWO-DIGIT-WU
        GO TO DUP-RECORD-CHECK.
    IF  D-EIVE-DIGIT-WU LESS THAN WU-CODE (1)
        GO TO READ-D-TAPE.
    IF D-FIVE-DIGIT-WU GREATER THAN WU-CODE (INDX3)
        GO TO READ-D-TAPE.
            MOVE 1 TO INDX1.
START-SEARCH.
            SUBTRACT INDX1 FROM INDX3 GIVING INDX4.
    IF INDX4 = 1
        GO TO ONLY-TWO-LEFT.
            ADD INDX1, INDX3, 1 GIVING INDX2A.
            DIVIDE 2 INTO INDX2A GIVING INDX2.
    IF D-FIVE-DIGIT-WU LESS THAN WU-CODE (INDX2)
        MOVE INDX2 TO INDX3
        GO TO START-SEARCH.
            MOVE INDX2 TO INDX1.
            GO TO START-SEARCH.
ONLY-TWO-LEFT.
    IF D-FIVE-DIGIT-WU = WU-CODE (INDX1) OR
        D-FIVE-DIGIT-WU = WU-CODE (INDX3)
        NEXT SENTENCE
    ELSE
        GO TO READ-D-TAPE.
DUP-RECORD-CHECK.
            ADD 1 TO DCTR9.
            MOVE 1 TO FILE-TYPE.
    IF  PREV-D-BUR-NO IS EQUAL TO D-BUR-NO  AND
        PREV-D-JCN-DATE IS EQUAL TO D-JCN-DATE AND
        PREV-D-JCN-SEQ  IS EQUAL TO D-JCN-SEQ  AND
        PREV-D-JCN-SUF  IS EQUAL TO D-JCN-SUF
        PERFORM DUP-RECORD-PRINT THRU DRP-EXIT
        GO TO READ-D-TAPE.
            MOVE D-RECORD TO PREV-D-RECORD.
            MOVE ZERO TO FIRST-ONE.
            EXAMINE D-WU-CODE TALLYING ALL SPACES.
    IF  TALLY IS GREATER THAN ZERO
        ADD 1 TO DCTR1
        GO TO READ-D-TAPE.
            EXAMINE D-JCN-DATE REPLACING ALL SPACES BY ZERO.
            EXAMINE D-JCN-SEQ REPLACING ALL SPACE BY ZERO.
            EXAMINE D-ML1-DATE REPLACING ALL SPACES BY ZERO.
            EXAMINE D-METER    REPLACING ALL SPACES BY ZERO.
    IF  D-JCN-DATE NOT NUMERIC
        ADD 1 TO DCTR2
        GO TO READ-D-TAPE.
    IF  D-JCN-SEQ  NOT NUMERIC
        ADD 1 TO DCTR8
        GO TO READ-D-TAPE.
    IF  D-ML1-DATE NOT NUMERIC
        ADD 1 TO DCTR3
        GO TO READ-D-TAPE.
    IF  D-METER    NOT NUMERIC
        ADD 1 TO DCTR5
        GO TO READ-D-TAPE.
    IF  D-ML1-YR IS LESS THAN D-JCN-YR
        ADD 1    D-JCN-DECADE GIVING JB-ML1-DECADE
    ELSE
        MOVE D-JCN-DECADE TO JB-ML1-DECADE.
            MOVE D-ML1-YR TO JB-ML1-YR.
            MOVE D-ML1-DAY TO JB-ML1-DAY.
    IF  JB-ML1-DATE IS LESS THAN D-JCN-DATE
        ADD 1 TO DCTR6
        GO TO READ-D-TAPE.
    IF  D-AIC2 = SPACE OR
        D-AIC2 = ZERO
        MOVE ZEROS TO JB-ML2-DATE
        GO TO MOVE-D-RECORD.
    IF  D-ML2-DATE-CHK = SPACES
        ADD 1 TO DCTR4
        GO TO READ-D-TAPE.
            EXAMINE D-ML2-DATE-CHK REPLACING ALL SPACES BY ZERO.
    IF  D-ML2-DATE NOT NUMERIC
        ADD 1 TO DCTR4
        GO TO READ-D-TAPE.
    IF  D-ML2-YR IS LESS THAN D-ML1-YR
        ADD 1    JB-ML1-DECADE GIVING JB-ML2-DECADE
    ELSE
        MOVE JB-ML1-DECADE TO JB-ML2-DECADE.
            MOVE D-ML2-YR TO JB-ML2-YR.
            MOVE D-ML2-DAY TO JB-ML2-DAY.
    IF  JB-ML2-DATE IS LESS THAN JB-ML1-DATE
        ADD 1 TO DCTR7
        GO TO READ-D-TAPE.
MOVE-D-RECORD.
            MOVE D-ORG-CODE TO JB-ORG-CODE.
            MOVE D-JCN-DATE TO JB-JCN-DATE.
            MOVE D-JCN-SEQ  TO JB-JCN-SEQ.
            MOVE D-JCN-SUF  TO JB-JCN-SUF.
```

```
00462                      MOVE D-TE-CODE   TO JB-TE-CODE.
00463                      MOVE D-BUR-NO    TO JB-BUR-NO.
00464                      MOVE D-FIVE-DIGIT-WU TO JB-WU-CODE.
00465                      MOVE D-ATC1      TO JB-ATC1.
00466                      MOVE D-HMC1      TO JB-HMC1.
00467                      MOVE D-ATC2      TO JB-ATC2.
00468                      MOVE D-HMC2      TO JB-HMC2.
00469                      MOVE D-SERIAL    TO JB-SER-NO.
00470                      EXAMINE D-SERIAL TALLYING ALL SPACES.
00471                      MOVE TALLY TO TALLY-SAVE.
00472                      EXAMINE D-SERIAL TALLYING ALL ZEROS.
00473                      ADD TALLY TO TALLY-SAVE.
00474              IF  TALLY-SAVE IS LESS THAN 10
00475                  NEXT SENTENCE ELSE
00476                  MOVE SPACES TO JB-SER-NO.
00477                      MOVE D-METER     TO JB-METER.
00478                      ADD 1 TO ECTR.
00479          READ-E-TAPE.
00480              IF  E-SEQ = D-SEQ
00481                  GO TO PROC-E-RECORD.
00482              IF  E-SEQ IS GREATER THAN D-SEQ
00403                  PERFORM NO-MATCH-PRINT
00484                  GO TO READ-D-TAPE.
00485              READ E-TAPE RECORD AT END
00486                  GO TO CLOSE-OUT.
00487                      MOVE E-BUR-NO        TO ES-BUR-NO.
00488                      MOVE E-JCN-DATE      TO ES-JCN-DATE.
00489                      MOVE E-JCN-SEQ       TO ES-JCN-SEQ.
00490                      MOVE E-JCN-SUF       TO ES-JCN-SUF.
00491                  GO TO READ-E-TAPE.
00492          PROC-E-RECORD.
00493                      EXAMINE E-MMH1 REPLACING ALL SPACES BY ZERO.
00494                      EXAMINE E-MMH2 REPLACING ALL SPACES BY ZERO.
00495              IF  E-MMH1 NOT NUMERIC
00496                  ADD 1 TO ECTR1
00497                  GO TO READ-D-TAPE.
00498              IF  E-MMH2 NOT NUMERIC
00499                  ADD 1 TO ECTR2
00500                  GO TO READ-D-TAPE.
00501          MOVE-E-RECORD.
00502                      MOVE E-MMH1 TO  JB-MMH1.
00503                      MOVE E-EMT1 TO  JB-EMT1.
00504                      MOVE E-MMH2 TO  JB-MMH2.
00505                      MOVE E-EMT2 TO  JB-EMT2.
00506                      ADD 1 TO PCTR.
00507          READ-P-TAPE.
00508              IF  P-SEQ = D-SEQ
00509                  GO TO PROC-P-RECORD.
00510              IF  P-SEQ IS GREATER THAN D-SEQ
00511                  PERFORM NO-MATCH-PRINT
00512                  GO TO READ-D-TAPE.
00513              READ P-TAPE RECORD AT END
00514                  GO TO CLOSE-OUT.
00515                      MOVE P-BUR-NO        TO PS-BUR-NO.
00516                      MOVE P-JCN-DATE      TO PS-JCN-DATE.
00517                      MOVE P-JCN-SEQ       TO PS-JCN-SEQ.
00518                      MOVE P-JCN-SUF       TO PS-JCN-SUF.
00519                  GO TO READ-P-TAPE.
00520          PROC-P-RECORD.
00521                      EXAMINE P-NORMU-TIME  REPLACING ALL SPACES BY ZERO.
00522                      EXAMINE P-NORS-TIME   REPLACING ALL SPACES BY ZERO.
00523              IF  P-NORMU-TIME NOT NUMERIC
00524                  ADD 1 TO PCTR1
00525                  GO TO READ-D-TAPE.
00526              IF  P-NORS-TIME  NOT NUMERIC
00527                  ADD 1 TO PCTR2
00528                  GO TO READ-D-TAPE.
00529              IF  P-AWM (1)    NOT NUMERIC
00530                  ADD 1 TO PCTR3
00531                  GO TO READ-D-TAPE.
00532              IF  P-AWM (2)    NOT NUMERIC
00533                  ADD 1 TO PCTR3
00534                  GO TO READ-D-TAPE.
00535              IF  P-AWM (3)    NOT NUMERIC
00536                  ADD 1 TO PCTR3
00537                  GO TO READ-D-TAPE.
00538              IF  P-AWM (4)    NOT NUMERIC
```

```
00539                    ADD 1 TO PCTR3
00540                    GO TO READ-D-TAPE.
00541               IF   P-AWM (5)    NOT NUMERIC
00542                    ADD 1 TO PCTR3
00543                    GO TO READ-D-TAPE.
00544               IF   P-AWM (6)    NOT NUMERIC
00545                    ADD 1 TO PCTR3
00546                    GO TO READ-D-TAPE.
00547               IF   P-AWM (7)    NOT NUMERIC
00548                    ADD 1 TO PCTR3
00549                    GO TO READ-D-TAPE.
00550           MOVE-P-RECORD.
00551                        MOVE P-NORMU-TIME TO JB-NORMU-TIME.
00552                        MOVE P-NORS-TIME  TO JB-NORS-TIME.
00553                        ADD P-AWM (1), P-AWM (2), P-AWM (3), P-AWM (4),
00554                        P-AWM (5), P-AWM (6), P-AWM (7) GIVING JB-AWM-TIME.
00555                        GO TO WRITE-DISK-RECORD.
00556           NO-MATCH-PRINT.
00557                        MOVE SPACES TO DUP-RECORD.
00558                        MOVE HDR28 TO DUPT-HDR.
00559                        WRITE DUP-RECORD AFTER POSITIONING 2 LINES.
00560                        MOVE SPACES TO DUP-RECORD.
00561                        MOVE D-RECORD TO DUPT-HDR.
00562                        WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00563           DUP-RECORD-PRINT.
00564               IF   PRT-CTR IS LESS THAN 28
00565                    GO TO PRINT-DATA-RECORD.
00566                        MOVE SPACES TO DUP-RECORD.
00567                        MOVE HDR-MSG TO DUP-HDR.
00568                        MOVE CURRENT-DATE TO DUP-DATE.
00569               WRITE DUP-RECORD AFTER POSITIONING 0 LINES.
00570                        MOVE SPACES TO DUP-RECORD.
00571                        MOVE HDR10 TO DUP-RECORD.
00572               WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00573                        MOVE ALL  *  TO DUP-ASTR, DUP-REC.
00574               WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00575                        MOVE ZEROS TO PRT-CTR.
00576           PRINT-DATA-RECORD.
00577               IF   FIRST-ONE = ZERO
00578                    MOVE 1 TO FIRST-ONE
00579                    ADD 1 TO PRT-CTR
00580                    MOVE SPACES TO DUP-RECORD
00581                    MOVE  FIRST  TO DUP-ASTR
00582                    MOVE PREV-D-RECORD TO DUP-REC
00583                    WRITE DUP-RECORD AFTER POSITIONING 2 LINES.
00584                        MOVE SPACES TO DUP-RECORD.
00585               IF   FILE-TYPE IS EQUAL TO 1
00586                        MOVE  OTAPE  TO DUP-ASTR
00587                        ADD 1 TO DDCTR
00588                        MOVE D-RECORD TO DUP-REC.
00589               IF   FILE-TYPE IS EQUAL TO 2
00590                        MOVE  ETAPE  TO DUP-ASTR
00591                        ADD 1 TO EDCTR
00592                        MOVE E-RECORD TO DUP-REC.
00593               IF   FILE-TYPE IS EQUAL TO 3
00594                        MOVE  PTAPE  TO DUP-ASTR
00595                        ADD 1 TO PDCTR
00596                        MOVE P-RECORD TO DUP-REC.
00597               WRITE DUP-RECORD AFTER POSITIONING 2 LINES.
00598                        ADD 1 TO PRT-CTR.
00599           DRP-EXIT.
00600                EXIT.
00601           WRITE-DISK-RECORD.
00602                        ADD 1 TO DCTR10.
00603               WRITE MERGED-RECORD
00604                      INVALID KEY DISPLAY   INVALID KEY FOR JBFILE =
00605                      JB-KEY UPON SYSLST.
00606                    GO TO READ-D-TAPE.
00607           CLOSE-OUT SECTION.
00608               CLOSE D-TAPE.
00609               CLOSE E-TAPE.
00610               CLOSE P-TAPE.
00611               CLOSE JB-JBW.
00612                        MOVE SPACES TO DUP-RECORD.
00613                        MOVE CURRENT-DATE TO DUP-DATE.
00614                        MOVE HDR9 TO DUP-HDR.
00615               WRITE DUP-RECORD AFTER POSITIONING 0 LINES.
```

```
00616                   MOVE SPACES TO DUP-RECORD.
00617                   MOVE ALL  -  TO DUP-HDR, DUP-DATE.
00618           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00619                   MOVE SPACES TO DUP-RECORD.
00620                   MOVE HDR1 TO DUPT-HDR.
00621           WRITE DUP-RECORD AFTER POSITIONING 3 LINES.
00622                   MOVE SPACES TO DUP-RECORD.
00623                   MOVE HDR2 TO DUPT-HDR.
00624           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00625                   MOVE SPACES TO DUP-RECORD.
00626                   MOVE HDR1 TO DUPT-HDR.
00627           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00628                   MOVE SPACES TO DUP-RECORD.
00629                   MOVE HDR3 TO DUPT-HDR.
00630           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00631                   MOVE SPACES TO DUP-RECORD.
00632                   MOVE HDR4 TO DUPT-HDR.
00633                   MOVE DCTR TO DUP-TOTD.
00634                   MOVE ECTR TO DUP-TOTE.
00635                   MOVE PCTR TO DUP-TOTP.
00636           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00637                   MOVE SPACES TO DUP-RECORD.
00638                   MOVE HDR5 TO DUPT-HDR.
00639           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00640                   MOVE SPACES TO DUP-RECORD.
00641                   MOVE HDR1 TO DUPT-HDR.
00642           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00643                   MOVE SPACES TO DUP-RECORD.
00644                   MOVE HDR25 TO DUPT-HDR.
00645           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00646                   MOVE SPACES TO DUP-RECORD.
00647                   MOVE HDR26 TO DUPT-HDR.
00648                   MOVE DCTR9 TO DUP-TOTD.
00649           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00650                   MOVE SPACES TO DUP-RECORD.
00651                   MOVE HDR27 TO DUPT-HDR.
00652           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00653                   MOVE SPACES TO DUP-RECORD.
00654                   MOVE HDR1  TO DUPT-HDR.
00655           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00656                   MOVE SPACES TO DUP-RECORD.
00657                   MOVE HDR3 TO DUPT-HDR.
00658           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00659                   MOVE SPACES TO DUP-RECORD.
00660                   MOVE HDR6 TO DUPT-HDR.
00661                   MOVE DDCTR TO DUP-TOTD.
00662                   MOVE EDCTR TO DUP-TOTE.
00663                   MOVE PDCTR TO DUP-TOTP.
00664           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00665                   MOVE SPACES TO DUP-RECORD.
00666                   MOVE HDR4 TO DUPT-HDR.
00667           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00668                   MOVE SPACES TO DUP-RECORD.
00669                   MOVE HDR1 TO DUPT-HDR.
00670           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00671                   MOVE SPACES TO DUP-RECORD.
00672                   MOVE HDR1 TO DUPT-HDR.
00673           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00674                   MOVE SPACES TO DUP-RECORD.
00675                   MOVE HDR11 TO DUPT-HDR.
00676                   ADD DCTR1, DCTR2, DCTR3, DCTR4, DCTR5, DCTR6,
00677                       DCTR7, DCTR8,        GIVING DUP-TOTD.
00678                   ADD ECTR1, ECTR2 GIVING DUP-TOTE.
00679                   ADD PCTR1, PCTR2, PCTR3 GIVING DUP-TOTP.
00680           WRITF DUP-RECORD AFTER POSITIONING 1 LINES.
00681                   MOVE SPACES TO DUP-RECORD.
00682                   MOVE HDR1 TO DUPT-HDR.
00683           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00684                   MOVE SPACES TO DUP-RECORD.
00685                   MOVE HDR12 TO DUPT-HDR.
00686                   MOVE DCTR1 TO DUP-TOTD.
00687                   MOVE ZEROS TO DUP-TOTE.
00688                   MOVE ZEROS TO DUP-TOTP.
00689           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00690                   MOVE SPACFS TO DUP-RECORD.
00691                   MOVE HDR1 TO DUPT-HDR.
00692           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
```

```
00693                  MOVE SPACES TO DUP-RECORD.
00694                  MOVE HDR13 TO DUPT-HDR.
00695                  MOVE DCTR2 TO DUP-TOTD.
00696                  MOVE ZEROS TO DUP-TOTE.
00697                  MOVE ZEROS TO DUP-TOTP.
00698              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00699                  MOVE SPACES TO DUP-RECORD.
00700                  MOVE HDR1 TO DUPT-HDR.
00701              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00702                  MOVE SPACES TO DUP-RECORD.
00703                  MOVE HDR24 TO DUPT-HDR.
00704                  MOVE DCTR8 TO DUP-TOTD.
00705                  MOVE ZEROS TO DUP-TOTE, DUP-TOTP.
00706              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00707                  MOVE SPACES TO DUP-RECORD.
00708                  MOVE HDR1  TO DUPT-HDR.
00709              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00710                  MOVE SPACES TO DUP-RECORD.
00711                  MOVE HDR14 TO DUPT-HDR.
00712                  MOVE DCTR3 TO DUP-TOTD.
00713                  MOVE ZEROS TO DUP-TOTE.
00714                  MOVE ZEROS TO DUP-TOTP.
00715              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00716                  MOVE SPACES TO DUP-RECORD.
00717                  MOVE HDR1 TO DUPT-HDR.
00718              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00719                  MOVE SPACES TO DUP-RECORD.
00720                  MOVE HDR16 TO DUPT-HDR.
00721                  MOVE DCTR5 TO DUP-TOTD.
00722                  MOVE ZEROS TO DUP-TOTE.
00723                  MOVE ZEROS TO DUP-TOTP.
00724              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00725                  MOVE SPACES TO DUP-RECORD.
00726                  MOVE HDR1 TO DUPT-HDR.
00727              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00728                  MOVE SPACES TO DUP-RECORD.
00729                  MOVE HDR17 TO DUPT-HDR.
00730                  MOVE DCTR6 TO DUP-TOTD.
00731                  MOVE ZEROS TO DUP-TOTE.
00732                  MOVE ZEROS TO DUP-TOTP.
00733              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00734                  MOVE SPACES TO DUP-RECORD.
00735                  MOVE HDR1 TO DUPT-HDR.
00736              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00737                  MOVE SPACES TO DUP-RECORD.
00738                  MOVE HDR15 TO DUPT-HDR.
00739                  MOVE DCTR4 TO DUP-TOTD.
00740                  MOVE ZEROS TO DUP-TOTE.
00741                  MOVE ZEROS TO DUP-TOTP.
00742              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00743                  MOVE SPACES TO DUP-RECORD.
00744                  MOVE HDR1 TO DUPT-HDR.
00745              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00746                  MOVE SPACES TO DUP-RECORD.
00747                  MOVE HDR18 TO DUPT-HDR.
00748                  MOVE DCTR7 TO DUP-TOTD.
00749                  MOVE ZEROS TO DUP-TOTE.
00750                  MOVE ZEROS TO DUP-TOTP.
00751              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00752                  MOVE SPACES TO DUP-RECORD.
00753                  MOVE HDR1 TO DUPT-HDR.
00754              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00755                  MOVE SPACES TO DUP-RECORD.
00756                  MOVE HDR19 TO DUPT-HDR.
00757                  MOVE ECTR1 TO DUP-TOTE.
00758                  MOVE ZEROS TO DUP-TOTD.
00759                  MOVE ZEROS TO DUP-TOTP.
00760              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00761                  MOVE SPACES TO DUP-RECORD.
00762                  MOVE HDR1 TO DUPT-HDR.
00763              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00764                  MOVE SPACES TO DUP-RECORD.
00765                  MOVE HDR20 TO DUPT-HDR.
00766                  MOVE ECTR2 TO DUP-TOTE.
00767                  MOVE ZEROS TO DUP-TOTD.
00768                  MOVE ZEROS TO DUP-TOTP.
00769              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
```

```
00770                      MOVE SPACES TO DUP-RECORD.
00771                      MOVE HDR1 TO DUPT-HDR.
00772              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00773                      MOVE SPACES TO DUP-RECORD.
00774                      MOVE HDR21 TO DUPT-HDR.
00775                      MOVE PCTR1 TO DUP-TOTP.
00776                      MOVE ZEROS TO DUP-TOTD.
00777                      MOVE ZEROS TO DUP-TOTE.
00778              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00779                      MOVE SPACES TO DUP-RECORD.
00780                      MOVE HDR1 TO DUPT-HDR.
00781              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00782                      MOVE SPACES TO DUP-RECORD.
00783                      MOVE HDR22 TO DUPT-HDR.
00784                      MOVE PCTR2 TO DUP-TOTP.
00785                      MOVE ZEROS TO DUP-TOTD.
00786                      MOVE ZEROS TO DUP-TOTE.
00787              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00788                      MOVE SPACES TO DUP-RECORD.
00789                      MOVE HDR1  TO DUPT-HDR.
00790              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00791                      MOVE SPACES TO DUP-RECORD.
00792                      MOVE HDR23 TO DUPT-HDR.
00793                      MOVE PCTR3 TO DUP-TOTP.
00794                      MOVE ZEROS TO DUP-TOTD.
00795                      MOVE ZEROS TO DUP-TOTE.
00796              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00797                      MOVE SPACES TO DUP-RECORD.
00798                      MOVE HDR1 TO DUPT-HDR.
00799              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00800                      MOVE SPACES TO DUP-RECORD.
00801                      MOVE HDR29 TO DUPT-HDR.
00802                      MOVE DCTR10  TO DUP-TOTP.
00803              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00804                      MOVE SPACES TO DUP-RECORD.
00805                      MOVE HDR1 TO DUPT-HDR.
00806              WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
00807              CLOSE PRT-MSG.
00808              STOP RUN.
```

```
CBL SXREF,STATE,QUOTE,CLIST,FLOW
                IDENTIFICATION DIVISION.
                PROGRAM-ID.  MRG2B.
                AUTHOR.  TONY GIRGENTI , ISI.
                ENVIRONMENT DIVISION.
                CONFIGURATION SECTION.
                SOURCE-COMPUTER. IBM-370.
                OBJECT-COMPUTER. IBM-370.
                INPUT-OUTPUT SECTION.
                FILE-CONTROL.
                    SELECT  DUP-PRT ASSIGN TO SYS008-UR-3203-S.
                    SELECT CRD-RDR ASSIGN TO SYS007-UR-1442R-S.
                    SELECT D-TAPE  ASSIGN TO SYS023-DA-3340-S
                           ACCESS MODE IS SEQUENTIAL.
                    SELECT E-TAPE  ASSIGN TO SYS024-DA-3340-S
                           ACCESS MODE IS SEQUENTIAL.
                    SELECT P-TAPE  ASSIGN TO SYS025-DA-3340-S
                           ACCESS MODE IS SEQUENTIAL.
                    SELECT  DE-DISK ASSIGN TO SYS016-DA-3340-S
                           ACCESS MODE IS SEQUENTIAL.
                    SELECT  P-DISK ASSIGN TO SYS017-DA-3340-I
                           ACCESS MODE IS SEQUENTIAL
                           RECORD KEY IS PA-KEY.
                DATA DIVISION.
                FILE SECTION.
                FD  CRD-RDR LABEL RECORD IS OMITTED
                           RECORDING MODE IS F
                           RECORD CONTAINS 80 CHARACTERS.
                01  CRD-RECORD.
                    05  CRD-FIELD OCCURS 13 TIMES.
                        10  CRD-WU  PICTURE IS X(5).
                        10  CRD-SPACER  PICTURE IS X.
                    05  FILLER              PICTURE IS XX.
                01  CRD-FIRST REDEFINES CRD-RECORD.
                    05  CRD-REDEF.
                        10  CRD-TWO-DIGIT     PICTURE IS XX.
                        10  CRD-BLANKS        PICTURE IS X(3).
                        10  CRD-SPCRS         PICTURE IS X(75).
                FD  D-TAPE  LABEL RECORD IS STANDARD
                           RECORDING MODE IS F
                           BLOCK CONTAINS 90 RECORDS
                           RECORD CONTAINS 85  CHARACTERS.
                01  D-RECORD.
                    05  D-ORG-CODE                  PICTURE IS XXX.
                    05  D-JCN-DATE                  PICTURE IS X(5).
                    05  D-JCN-DATE-CHK REDEFINES D-JCN-DATE.
                        10  D-JCN-DECADE            PIC 9.
                        10  D-JCN-YR                PIC X.
                        10  D-JCN-DAY               PIC XXX.
                    05  D-JCN-SEQ                   PICTURE IS XXX.
                    05  D-JCN-SUF                   PICTURE IS XX.
                    05  D-TE-CODE                   PICTURE IS XXXX.
                    05  D-BUR-NO                    PICTURE IS X(6).
                    05  D-WU-CODE.
                        10  D-TWO-DIGIT-WU          PICTURE IS XX.
                        10  D-REST-OF-WU            PICTURE IS X(5).
                    05  D-WU-CODES REDEFINES D-WU-CODE.
                        10  D-FIVE-DIGIT-WU         PICTURE IS X(5).
                        10  D-2LEFT                 PICTURE IS XX.
                    05  FILLER                      PICTURE IS XX.
                    05  D-ML1-DATE                  PICTURE IS XXXX.
                    05  D-ML1-DATE-CHK REDEFINES D-ML1-DATE.
                        10  D-ML1-YR                PIC X.
                        10  D-ML1-DAY               PIC XXX.
                    05  D-ATC1                      PICTURE IS X.
                    05  D-HMC1                      PICTURE IS XXX.
                    05  D-ML2-DATE                  PICTURE IS XXXX.
                    05  D-ML2-DATE-CHK REDEFINES D-ML2-DATE.
                        10  D-ML2-YR                PIC X.
                        10  D-ML2-DAY               PIC XXX.
                    05  D-ATC2                      PICTURE IS X.
                    05  D-HMC2                      PICTURE IS XXX.
                    05  FILLER                      PICTURE IS X(5).
                    05  D-SERIAL                    PICTURE IS X(10).
                    05  FILLER                      PICTURE IS X(16).
                    05  D-METER                     PICTURE IS XXXX.
                    05  FILLER                      PIC XX.
```

```
       FD  E-TAPE   LABEL RECORD IS STANDARD
                    RECORDING MODE IS F
                    BLOCK CONTAINS 60 RECORDS
                    RECORD CONTAINS 126 CHARACTERS.
       01  E-RECORD.
           05  E-ORG-CODE                PICTURE IS XXX.
           05  E-JCN-DATE                PICTURE IS X(5).
           05  E-JCN-SEQ                 PICTURE IS XXX.
           05  E-JCN-SUF                 PICTURE IS XX.
           05  E-TE-CODE                 PICTURE IS XXXX.
           05  E-BUR-NO                  PICTURE IS X(6).
           05  E-WU-CODE.
               10  E-TWO-DIGIT-WU        PICTURE IS XX.
               10  E-REST-OF-WU          PICTURE IS X(5).
           05  E-WU-CODES REDEFINES E-WU-CODE.
               10  E-FIVE-DIGIT-WU       PICTURE IS X(5).
               10  E-2LEFT               PICTURE IS XX.
           05  FILLER                    PICTURE IS X(6).
           05  E-MMH1                    PICTURE IS X(5).
           05  E-EMT1                    PICTURE IS X(5).
           05  FILLER                    PICTURE IS X(7).
           05  E-MMH2                    PICTURE IS X(5).
           05  E-EMT2                    PICTURE IS X(5).
           05  E-SERIAL                  PIC X(10).
           05  FILLER                    PIC X(53).
       FD  P-TAPE   LABEL RECORD IS STANDARD
                    RECORDING MODE IS F
                    BLOCK CONTAINS 60 RECORDS
                    RECORD CONTAINS 134 CHARACTERS.
       01  P-RECORD.
           05  FILLER                    PICTURE IS XXX.
           05  P-JCN-DATE                PICTURE IS X(5).
           05  P-JCN-SEQ                 PICTURE IS XXX.
           05  P-JCN-SUF                 PICTURE IS XX.
           05  FILLER                    PICTURE IS XXXX.
           05  P-BUR-NO                  PICTURE IS X(6).
           05  P-WU-CODE.
               10  P-TWO-DIGIT-WU        PICTURE IS XX.
               10  P-REST-OF-WU          PICTURE IS X(5).
           05  P-WU-CODES REDEFINES P-WU-CODE.
               10  P-FIVE-DIGIT-WU       PICTURE IS X(5).
               10  P-2LEFT               PICTURE IS XX.
           05  P-ATC1                    PIC X.
           05  P-IMC1                    PIC XXX.
           05  P-MMH1                    PIC X(5).
           05  P-EMT1                    PIC X(5).
           05  P-ATC2                    PIC X.
           05  P-IMC2                    PIC XXX.
           05  P-MMH2                    PIC X(5).
           05  P-EMT2                    PIC X(5).
           05  P-NORMU-TIME              PICTURE IS X(5).
           05  P-NORS-TIME               PICTURE IS X(5).
           05  P-AWM        OCCURS 7 TIMES PICTURE IS 9999.
           05  FILLER                    PICTURE IS X(38).
       FD  DE-DISK        LABEL RECORD IS STANDARD
                          RECORDING MODE IS F
                    BLOCK CONTAINS 90  RECORDS
                    RECORD CONTAINS 80  CHARACTERS.
       01  MERGED-DE.
           05  DE-KEY.
               10  DE-WU-CODE            PIC X(5).
               10  DE-SER-NO             PIC X(10).
               10  DE-JCN-DATE           PIC X(5).
               10  DE-JCN-SEQ            PIC XXX.
               10  DE-JCN-SUF            PIC XX.
           05  DE-TE-CODE             PICTURE IS XXXX.
           05  DE-BUR-NO              PICTURE IS X(6).
           05  DE-ORG-CODE            PICTURE IS XXX.
           05  DE-ML1-DATE                   PIC XXXXX.
           05  DE-ML1-DATE-CHK REDEFINES DE-ML1-DATE.
                   15  DE-ML1-DECADE     PIC 9.
                   15  DE-ML1-YR         PIC X.
                   15  DE-ML1-DAY        PIC XXX.
           05  DE-ATC1                PICTURE IS X.
           05  DE-IMC1                PICTURE IS XXX.
           05  DE-ML2-DATE                   PIC XXXXX.
           05  DE-ML2-DATE-CHK REDEFINES DE-ML2-DATE.
```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

```
                      15  DE-ML2-DECADE    PIC 9.
                      15  DE-ML2-YR        PIC X.
                      15  DE-ML2-DAY       PIC XXX.
           05  DE-ATC2                 PICTURE IS X.
           05  DE-UMC2                 PICTURE IS XXX.
           05  DE-METER                PICTURE IS XXXX.
           05  DE-MMH1                 PICTURE IS X(5).
           05  DE-FMT1                 PICTURE IS X(5).
           05  DE-MMH2                 PICTURE IS X(5).
           05  DE-FMT2                 PICTURE IS X(5).
       FD  P-DISK         LABEL RECORD IS STANDARD
                          RECORDING MODE IS F
                      BLOCK CONTAINS 150 RECORDS
                      RECORD CONTAINS 35  CHARACTERS.
       01  P-ALONE.
           05  PA-KEY.
               10  PA-BUR-NO               PIC X(6).
               10  PA-JCN-DATE             PIC X(5).
               10  PA-JCN-SEQ              PIC XXX.
               10  PA-JCN-SUF              PIC XX.
           05  PA-WU-CODE              PICTURE IS X(5).
           05  PA-NORMU-TIME           PICTURE IS X(5).
           05  PA-NORS-TIME            PICTURE IS X(5).
           05  PA-AWM                  PICTURE IS 9999.
       FD  DUP-PRT        LABEL RECORD IS OMITTED
                          RECORDING MODE IS F
                          RECORD CONTAINS 132 CHARACTERS.
       01  DUP-RECORD.
               10  FILLER       PICTURE IS X(33).
               10  DUP-HDR      PICTURE IS X(60).
               10  DUP-DATE     PICTURE IS X(8).
               10  FILLER       PICTURE IS X(31).
       01  DUP-TAPE-RECORD REDEFINES DUP-RECORD.
               10  FILLER       PICTURE IS X(5).
               10  DUP-ASTR     PICTURE IS X(5).
               10  FILLER       PICTURE IS XX.
               10  DUP-REC             PICTURE IS X(110).
               10  FILLER              PICTURE IS X(10).
       01  DUP-TOTAL-PRINT REDEFINES DUP-TAPE-RECORD.
               10  FILLER                  PIC X(33).
               10  DUPT-HDR                PIC X(68).
               10  FILLER                  PIC X(31).
       01  DUP-TOTALS REDFFINES DUP-TOTAL-PRINT.
               10  FILLER                  PIC X(54).
               10  DUP-TOTD                PIC Z(6).
               10  FILLER                  PIC X(10).
               10  DUP-TOTE                PIC Z(6).
               10  FILLER                  PIC X(10).
               10  DUP-TOTP                PIC Z(6).
               10  FILLER                  PIC X(40).
       WORKING-STORAGE SECTION.
       77  FIRST-ONE                       PIC 9 VALUE ZERO.
       77  PRT-CTR                         PIC 99.
       77  WU-SUB            PICTURE IS 999.
       77  TOTAL-WU-CODES                  PIC 999.
       77  INDX1                           PIC 999.
       77  INDX2                           PIC 999.
       77  INDX2A                          PIC 999.
       77  INDX3                           PIC 999.
       77  INDX4                           PIC 999.
       77  CRD-SUB           PICTURE IS 99.
       77  FILE-TYPE               PICTURE IS 9.
       77  TWO-DIGIT-WU      PICTURE IS XX.
       77  PRO-SW            PICTURE IS 9.
       77  HDR-MSG        PICTURF IS X(60) VALUE IS  THE FOLLOWING RECORDS
      -                   ARE DUPLICATED  PROGRAM NO 2B   DATE   .
       77  HDR1      PIC X(68) VALUF  ********************************************
      -               *******************************.
       77  HDR2      PIC X(68) VALUE  *                    *     DTAPE      *
      -                 ETAPE     *     PTAPE           *.
       77  HDR3      PIC X(68) VALUE  * NUMBER OF           *                *
      -                           *                     *.
       77  HDR4      PIC X(68) VALUF  * RECORDS             *                *
      -                           *                     *.
       77  HDR5      PIC X(68) VALUF  * READ IN             *                *
      -                           *                     *.
       77  HDR6      PIC X(68) VALUF  * DUPLICATE           *                *
```

```
-                                *                                  *
        77  HDR7      PIC X(68) VALUE  * RECORDS USED  *            *
-                                *                                 * .
        77  HDR8      PIC X(68) VALUE  * IN MERGE      *            *
-                                *                                 * .
        77  HDR9      PIC X(60) VALUE   TOTALS FOR PROGRAM NO 2B
-                                             DATE      .
        77  HDR10     PIC X(69) VALUE               SOURCE
-                                            DATA RECORD   .
        77  HDR11     PIC X(68) VALUE   NO MATCH FOR THE FOLLOWING DRECORD .
        77  TEST-IT                     PICTURE IS 999.
        77  TEST-MSG       PICTURE IS X(44) VALUE IS  ***** HOW MANY UNBYPAS
-                              SED RECORDS FOR TEST    .
        77  RECORD-CTR                        PIC 999.
        77  TALLY-SAVE                        PIC 99.
        01  SEVEN-DIGIT-WU-TABLE.
            05  WU-CODE OCCURS 500 TIMES PICTURE IS X(5).
        01  PREV-D-RECORD.
            05   FILLER                 PICTURE IS XXX.
            05   PREV-D-JCN-DATE        PICTURE IS X(5).
            05   PREV-D-JCN-SEQ         PICTURE IS XXX.
            05   PREV-D-JCN-SUF         PICTURE IS XX.
            05   FILLER                 PICTURE IS XXXX.
            05   PREV-D-BUR-NO          PICTURE IS X(6).
            05   PREV-D-WU-CODE               PIC X(5).
            05   FILLER                       PIC X(25).
            05   PREV-D-SERIAL                PIC X(10).
            05   FILLER                       PIC X(22).
        01  PREV-P-RECORD.
            05   FILLER                 PICTURE IS XXX.
            05   PREV-P-JCN-DATE        PICTURE IS X(5).
            05   PREV-P-JCN-SEQ         PICTURE IS XXX.
            05   PREV-P-JCN-SUF         PICTURE IS XX.
            05   FILLER                 PICTURE IS XXXX.
            05   PREV-P-BUR-NO          PICTURE IS X(6).
            05   FILLER                 PICTURE IS X(111).
        01  D-SEQ.
            05   DS-WU-CODE                 PIC X(5) VALUE SPACES.
            05   DS-SER-NO                  PIC X(10) VALUE SPACES.
            05   DS-JCN-DATE                PIC X(5) VALUE SPACES.
            05   DS-JCN-SEQ                 PIC XXX VALUE SPACES.
            05   DS-JCN-SUF                 PIC XX VALUE SPACES.
        01  E-SEQ.
            05   ES-WU-CODE                 PIC X(5) VALUE SPACES.
            05   ES-SER-NO                  PIC X(10) VALUE SPACES.
            05   ES-JCN-DATE                PIC X(5) VALUE SPACES.
            05   ES-JCN-SEQ                 PIC XXX VALUE SPACES.
            05   ES-JCN-SUF                 PIC XX VALUE SPACES.
        PROCEDURE DIVISION.
                      MOVE 1 TO WU-SUB.
                      MOVE ZEROS TO PREV-D-RECORD.
                      MOVE ZEROS TO PREV-P-RECORD.
                      MOVE 28 TO PRT-CTR.
                      OPEN INPUT CRD-RDR.
        READ-A-CARD.
                      MOVE 1 TO CRD-SUB.
                      MOVE SPACES TO CRD-RECORD.
            READ CRD-RDR RECORD AT END GO TO OPEN-TAPE-FILES.
            IF   CRD-BLANKS IS NOT EQUAL TO SPACES
                 GO TO FIVE-DIGIT-TABLE-SETUP.
                      MOVE CRD-TWO-DIGIT TO TWO-DIGIT-WU.
                      ADD 1 TO CRD-SUB.
        FIVE-DIGIT-TABLE-SETUP.
            IF   CRD-WU (CRD-SUB) = SPACES
                 GO TO READ-A-CARD.
                      MOVE CRD-WU (CRD-SUB) TO WU-CODE (WU-SUB).
                      ADD 1 TO CRD-SUB.
                      ADD 1 TO WU-SUB.
            IF   CRD-SUB IS GREATER THAN 13
                 GO TO READ-A-CARD.
                      GO TO FIVE-DIGIT-TABLE-SETUP.
        OPEN-TAPE-FILES.
                      SUBTRACT 1 FROM WU-SUB.
                      MOVE WU-SUB TO INDX1, TOTAL-WU-CODES.
                      OPEN INPUT D-TAPE.
                      OPEN INPUT E-TAPE.
                      OPEN INPUT P-TAPE.
                 OPEN OUTPUT DE-DISK.
                 OPEN OUTPUT P-DISK.
           OPEN OUTPUT DUP-PRT
                 CLOSE CRD-RDR.
READ-D-TAPE.
                 MOVE 1 TO WU-SUB.
                 MOVE SPACES TO D-RECORD, MERGED-DE.
      READ D-TAPE RECORD AT END GO TO READ-P-TAPE.
                 MOVE D-WU-CODE          TO DS-WU-CODE.
                 MOVE D-SERIAL           TO DS-SER-NO.
                 MOVE D-JCN-DATE         TO DS-JCN-DATE.
                 MOVE D-JCN-SEQ          TO DS-JCN-SEQ.
                 MOVE D-JCN-SUF          TO DS-JCN-SUF.
      IF  D-TWO-DIGIT-WU = TWO-DIGIT-WU
           GO TO SERIAL-NO-CHECK.
      IF  D-FIVE-DIGIT-WU LESS THAN WU-CODE (1)
           GO TO READ-D-TAPE.
      IF D-FIVE-DIGIT-WU GREATER THAN WU-CODE (INDX3)
           GO TO READ-D-TAPE.
                 MOVE 1 TO INDX1.
START-SEARCH.
                 SUBTRACT INDX1 FROM INDX3 GIVING INDX4.
      IF INDX4 = 1
           GO TO ONLY-TWO-LEFT.
                 ADD INDX1, INDX3, 1 GIVING INDX2A.
                 DIVIDE 2 INTO INDX2A GIVING INDX2.
      IF D-FIVE-DIGIT-WU LESS THAN WU-CODE (INDX2)
           MOVE INDX2 TO INDX3
           GO TO START-SEARCH.
                 MOVE INDX2 TO INDX1.
                 GO TO START-SEARCH.
ONLY-TWO-LEFT.
      IF D-FIVE-DIGIT-WU = WU-CODE (INDX1) OR
           D-FIVE-DIGIT-WU = WU-CODE (INDX3)
           NEXT SENTENCE
      ELSE
           GO TO READ-D-TAPE.
SERIAL-NO-CHECK.
                 EXAMINE D-SERIAL TALLYING ALL SPACES.
                 MOVE TALLY TO TALLY-SAVE.
                 EXAMINE D-SERIAL TALLYING ALL ZEROS.
                 ADD TALLY TO TALLY-SAVE.
      IF  TALLY-SAVE IS LESS THAN 10
           NEXT SENTENCE ELSE
           MOVE SPACES TO D-SERIAL.
DUP-RECORD-CHECK.
                 MOVE 1 TO FILE-TYPE.
      IF  PREV-D-WU-CODE IS EQUAL TO D-FIVE-DIGIT-WU AND
           PREV-D-SERIAL IS EQUAL TO D-SERIAL AND
           PREV-D-JCN-DATE  IS EQUAL TO D-JCN-DATE AND
           PREV-D-JCN-SEQ   IS EQUAL TO D-JCN-SEQ  AND
           PREV-D-JCN-SUF   IS EQUAL TO D-JCN-SUF
           PERFORM DUP-RECORD-PRINT THRU DRP-EXIT
           GO TO READ-D-TAPE.
                 MOVE D-RECORD TO PREV-D-RECORD.
                 MOVE ZERO TO FIRST-ONE.
                 EXAMINE D-WU-CODE TALLYING ALL SPACES.
      IF  TALLY IS GREATER THAN ZERO
           GO TO READ-D-TAPE.
                 EXAMINE D-JCN-DATE REPLACING ALL SPACES BY ZERO.
                 EXAMINE D-JCN-SEQ REPLACING ALL SPACES BY ZERO.
                 EXAMINE D-MLI-DATE REPLACING ALL SPACES BY ZERO.
                 EXAMINE D-METER    REPLACING ALL SPACES BY ZERO.
      IF  D-JCN-DATE NOT NUMERIC
           GO TO READ-D-TAPE.
      IF  D-JCN-SEQ NOT NUMERIC
           GO TO READ-D-TAPE.
      IF  D-MLI-DATE NOT NUMERIC
           GO TO READ-D-TAPE.
      IF  D-METER     NOT NUMERIC
           GO TO READ-D-TAPE.
      IF  D-MLI-YR IS LESS THAN D-JCN-YR
           ADD 1      D-JCN-DECADE GIVING DE-MLI-DECADE
      ELSE
           MOVE D-JCN-DECADE TO DE-MLI-DECADE.
                 MOVE D-MLI-YR TO DE-MLI-YR.
                 MOVE D-MLI-DAY TO DE-MLI-DAY.
```

```
00385            IF   DE-ML1-DATE IS LESS THAN D-JCN-DATE
00386                 GO TO READ-D-TAPE.
00387            IF   D-ATC2 = SPACE OR
00388                 D-ATC2 = ZERO
00389                 MOVE ZEROS TO DE-ML2-DATE
00390                 GO TO MOVE-D-RECORD.
00391            IF   D-ML2-DATE = SPACES
00392                 GO TO READ-D-TAPE.
00393                     EXAMINE D-ML2-DATE REPLACING ALL SPACES BY ZERO.
00394            IF   D-ML2-DATE NOT NUMERIC
00395                 GO TO READ-D-TAPE.
00396            IF   D-ML2-YR IS LESS THAN D-ML1-YR
00397                 ADD 1   DE-ML1-DECADE GIVING DE-ML2-DECADE
00398            ELSE
00399                 MOVE DE-ML1-DECADE TO DE-ML2-DECADE.
00400                     MOVE D-ML2-YR TO DE-ML2-YR.
00401                     MOVE D-ML2-DAY TO DE-ML2-DAY.
00402            IF   DE-ML2-DATE IS LESS THAN DE-ML1-DATE
00403                 GO TO READ-D-TAPE.
00404        MOVE-D-RECORD.
00405                     MOVE D-ORG-CODE  TO DE-ORG-CODE.
00406                     MOVE D-JCN-DATE  TO DE-JCN-DATE.
00407                     MOVE D-JCN-SEQ   TO DE-JCN-SEQ.
00408                     MOVE D-JCN-SUF   TO DE-JCN-SUF.
00409                     MOVE D-TE-CODE   TO DE-TE-CODE.
00410                     MOVE D-BUR-NO    TO DE-BUR-NO.
00411                     MOVE D-FIVE-DIGIT-WU TO DE-WU-CODE.
00412                     MOVE D-ATC1        TO DE-ATC1.
00413                     MOVE D-HMC1        TO DE-HMC1.
00414                     MOVE D-ATC2        TO DE-ATC2.
00415                     MOVE D-HMC2        TO DE-HMC2.
00416                     MOVE D-SERIAL      TO DE-SER-NO.
00417                     MOVE D-METER       TO DE-METER.
00418        READ-E-TAPE.
00419            IF   E-SEQ = D-SEQ
00420                 GO TO PROC-E-RECORD.
00421            IF   E-SEQ IS GREATER THAN D-SEQ
00422                 PERFORM NO-MATCH-PRINT
00423                 GO TO READ-D-TAPE.
00424            READ E-TAPE RECORD AT END
00425                 GO TO CLOSE-OUT.
00426                     MOVE E-WU-CODE        TO ES-WU-CODE.
00427                     MOVE E-SERIAL         TO ES-SER-NO.
00428                     MOVE E-JCN-DATE       TO ES-JCN-DATE.
00429                     MOVE E-JCN-SEQ        TO ES-JCN-SEQ.
00430                     MOVE E-JCN-SUF        TO ES-JCN-SUF.
00431                 GO TO READ-E-TAPE.
00432        PROC-E-RECORD.
00433                     EXAMINE E-MMH1 REPLACING ALL SPACES BY ZERO.
00434                     EXAMINE E-MMH2 REPLACING ALL SPACES BY ZERO.
00435            IF   E-MMH1 NOT NUMERIC OR
00436                 E-MMH2 NOT NUMERIC
00437                 GO TO READ-D-TAPE.
00438        MOVE-E-RECORD.
00439                     MOVE E-MMH1  TO DE-MMH1.
00440                     MOVE E-EMT1  TO DE-EMT1.
00441                     MOVE E-MMH2  TO DE-MMH2.
00442                     MOVE E-EMT2  TO DE-EMT2.
00443        WRITE-DE.
00444            WRITE MERGED-DE INVALID KEY
00445                     DISPLAY  INVALID KED =   DE-KEY UPON SYSLST.
00446            GO TO READ-D-TAPE.
00447        READ-P-TAPE.
00448                     MOVE SPACES TO P-RECORD, P-ALONE.
00449            READ P-TAPE RECORD AT END GO TO CLOSE-OUT.
00450                     MOVE 1 TO WU-SUB.
00451            IF   P-TWO-DIGIT-WU      =              TWO-DIGIT-WU
00452                 GO TO DUP-RECORD-CHECK-P.
00453                     MOVE TOTAL-WU-CODES TO INDX3.
00454            IF   P-FIVE-DIGIT-WU LESS THAN WU-CODE (1)
00455                 GO TO READ-P-TAPE.
00456            IF P-FIVE-DIGIT-WU GREATER THAN WU-CODE (INDX3)
00457                 GO TO READ-P-TAPE.
00458                     MOVE 1 TO INDX1.
00459        START-SEARCH-P.
00460                     SUBTRACT INDX1 FROM INDX3 GIVING INDX4.
00461            IF INDX4 = 1
```

```
        GO TO ONLY-TWO-LEFT-P.
            ADD INDX1, INDX3, 1 GIVING INDX2A.
            DIVIDE 2 INTO INDX2A GIVING INDX2.
    IF P-FIVE-DIGIT-WU LESS THAN WU-CODE (INDX2)
        MOVE INDX2 TO INDX3
        GO TO START-SEARCH-P.
            MOVE INDX2 TO INDX1.
            GO TO START-SEARCH-P.
ONLY-TWO-LEFT-P.
    IF P-FIVE-DIGIT-WU = WU-CODE (INDX1) OR
        P-FIVE-DIGIT-WU = WU-CODE (INDX3)
        NEXT SENTENCE
    ELSE
        GO TO READ-P-TAPE.
DUP-RECORD-CHECK-P.
            MOVE 3 TO FILE-TYPE.
    IF  PREV-P-BUR-NO IS EQUAL TO P-BUR-NO  AND
        PREV-P-JCN-DATE IS EQUAL TO P-JCN-DATE AND
        PREV-P-JCN-SEQ  IS EQUAL TO P-JCN-SEQ  AND
        PREV-P-JCN-SUF  IS EQUAL TO P-JCN-SUF
        PERFORM DUP-RECORD-PRINT THRU DRP-EXIT
        GO TO READ-P-TAPE.
            MOVE P-RECORD TO PREV-P-RECORD.
            MOVE ZERO TO FIRST-ONE.
            EXAMINE P-WU-CODE TALLYING ALL SPACES.
    IF  TALLY IS GREATER THAN ZERO
        GO TO READ-P-TAPE.
            EXAMINE P-JCN-DATE REPLACING ALL SPACES BY ZERO.
            EXAMINE P-JCN-SEQ REPLACING ALL SPACES BY ZERO.
    IF  P-JCN-DATE NOT NUMERIC
        GO TO READ-P-TAPE.
    IF  P-JCN-SEQ NOT NUMERIC
        GO TO READ-P-TAPE.
            EXAMINE P-NORMU-TIME REPLACING ALL SPACES BY ZERO.
            EXAMINE P-NORS-TIME  REPLACING ALL SPACES BY ZERO.
    IF  P-NORMU-TIME NOT NUMERIC
        GO TO READ-P-TAPE.
    IF  P-NORS-TIME  NOT NUMERIC
        GO TO READ-P-TAPE.
    IF  P-AWM (1)    NOT NUMERIC OR
        P-AWM (2)    NOT NUMERIC OR
        P-AWM (3)    NOT NUMERIC OR
        P-AWM (4)    NOT NUMERIC OR
        P-AWM (5)    NOT NUMERIC OR
        P-AWM (6)    NOT NUMERIC OR
        P-AWM (7)    NOT NUMERIC
        GO TO READ-P-TAPE.
MOVE-P-RECORD.
            MOVE P-FIVE-DIGIT-WU TO PA-WU-CODE.
            MOVE P-JCN-DATE TO PA-JCN-DATE.
            MOVE P-JCN-SEQ  TO PA-JCN-SEQ.
            MOVE P-JCN-SUF   TO  PA-JCN-SUF.
            MOVE P-BUR-NO       TO PA-BUR-NO.
            MOVE P-NORMU-TIME TO PA-NORMU-TIME
            MOVE P-NORS-TIME  TO PA-NORS-TIME
            ADD P-AWM (1), P-AWM (2), P-AWM (3), P-AWM (4),
                P-AWM (5), P-AWM (6), P-AWM (7) GIVING PA-AWM.
WRITE-P.
        WRITE P-ALONE INVALID KEY
            DISPLAY  INVALID KEP =    PA-KEY UPON SYSLST.
            GO TO READ-P-TAPE.
NO-MATCH-PRINT.
            MOVE SPACES TO DUP-RECORD.
            MOVE HDR11 TO DUPT-HDR.
            WRITE DUP-RECORD AFTER POSITIONING 2 LINES.
            MOVE SPACES TO DUP-RECORD.
            MOVE D-RECORD TO DUPT-HDR.
            WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
DUP-RECORD-PRINT.
    IF  PRT-CTR IS LESS THAN 28
        GO TO PRINT-DATA-RECORD.
            MOVE SPACES TO DUP-RECORD.
            MOVE HDR-MSG TO DUP-HDR.
            MOVE CURRENT-DATE TO DUP-DATE.
    WRITE DUP-RECORD AFTER POSITIONING 0 LINES.
            MOVE SPACES TO DUP-RECORD.
            MOVE HDR10 TO DUP-RECORD.
```

```
           WRITF DUP-RECORD AFTER POSITIONING 1 LINES.
                     MOVE ALL  *  TO DUP=ASTR. DUP=REC.
           WRITE DUP-RECORD AFTER POSITIONING 1 LINES.
                     MOVE ZEROS TO PRT-CTR.
       PRINT-DATA-PECORD.
           IF  FIRST-ONE = ZERO
                MOVF 1 TO FIRST-ONE
                ADD 1 TO PRT-CTR
                MOVE SPACES TO DUP-RECOPD
                MOVE  FIRST  TO DUP-ASTR
           IF  FILE-TYPE = 1
                MOVE PRFV-D-RECORD TO DUP-REC
                WRITE DUP-RECORD AFTER POSITIONING 2 LINES
           ELSE
                MOVE PREV-P-RECCRD TO DUP-REC
                WRITF DUP-RECOPD AFTER POSITIONING 2 LINFS.
                     MOVE SPACES TO DUP-RECORD.
           IF  FILE=TYPE IS EQUAL TO 1
                     MOVF  DTAPE  TO DUP-ASTR
                     MOVE D-RECORD TO DUP-REC.
           IF  FILF-TYPF IS EQUAL TO 2
                     MOVE  ETAPE  TO DUP-ASTR
                     MOVE E-RECORD TO DUP-REC.
           IF  FILE-TYPE IS EQUAL TO 3
                     MOVF  PTAPE  TO DUP-ASTR
                     MOVE P-RECORD TO DUP-REC.
           WRITE DUP-RECORD AFTER POSITIONING 2 LINFS.
                     ADD 1 TO PRT-CTR.
       DPP-EXIT.
           EXIT.
       CLOSE-OUT SECTION.
                     CLOSE D-TAPE.
                     CLOSE E-TAPE.
                     CLOSE P-TAPE.
                     CLOSE DF-DISK.
                     CLOSE P-DISK.
                     STOP RUN.
```

```
CBL SXREF,STATE,QUOTE,CLIST,FLOW
            IDENTIFICATION DIVISION.
            PROGRAM-ID. ISIMRG2C.
            AUTHOR. TONY GIRGENTI , ISI.
            ENVIRONMENT DIVISION.
            CONFIGURATION SECTION.
            SOURCE-COMPUTER. IBM-370.
            OBJECT-COMPUTER. IBM-370.
            INPUT-OUTPUT SECTION.
            FILE-CONTROL.
                SELECT  PA-DISK ASSIGN TO SYS017-DA-3340-I
                        ACCESS MODE IS RANDOM
                        RECORD KEY IS PA-KEY, NOMINAL KEY IS NUM-PA-KEY.
                SELECT  JW  ASSIGN TO SYS021-DA-3340-S
                            ACCESS MODE IS SEQUENTIAL.
                SELECT  JSW ASSIGN TO SYS022-DA-3340-I
                            ACCESS MODE IS SEQUENTIAL
                            RECORD KEY IS JSW-KEY.
                SELECT  D-DISK  ASSIGN TO SYS019-DA-3340-S
                        ACCESS MODE IS SEQUENTIAL.
            DATA DIVISION.
            FILE SECTION.
            FD  JW      LABEL RECORD IS STANDARD
                        RECORDING MODE IS F
                        BLOCK CONTAINS 60 RECORDS
                        RECORD CONTAINS 112 CHARACTERS.
            01  JW-RECORD.
                05  DEP-MERGED.
                    10  JW-KEY.
                        15  JW-WU-CODE   PICTURE IS X(5).
                        15  JW-JCN-DATE  PICTURE IS X(5).
                        15  JW-JCN-SEQ   PICTURE IS XXX.
                        15  JW-JCN-SUF   PICTURE IS XX.
                    10  FILLER           PICTURE IS X.
                    10  JW-TE-CODE       PICTURE IS XXXX.
                    10  FILLER           PICTURE IS X.
                    10  JW-BUR-NO        PICTURE IS X(6).
                    10  FILLER           PICTURE IS X.
                    10  JW-SER-NO        PICTURE IS X(10).
                    10  FILLER           PICTURE IS X.
                    10  JW-ORG-CODE      PICTURE IS XXX.
                    10  FILLER           PICTURE IS X.
                    10  JW-ML1-DATE      PICTURE IS X(5).
                    10  FILLER           PICTURE IS X.
                    10  JW-ML2-DATE      PICTURE IS X(5).
                    10  FILLER           PICTURE IS X.
                    10  JW-ATC1          PICTURE IS X.
                    10  FILLER           PICTURE IS X.
                    10  JW-ATC2          PICTURE IS X.
                    10  FILLER           PICTURE IS X.
                    10  JW-HMC1          PICTURE IS XXX.
                    10  FILLER           PICTURE IS X.
                    10  JW-HMC2          PICTURE IS XXX.
                    10  FILLER           PICTURE IS X.
                    10  JW-METER         PICTURE IS X(4).
                    10  FILLER           PICTURE IS X.
                    10  JW-FMT1          PICTURE IS X(5).
                    10  FILLER           PICTURE IS X.
                    10  JW-FMT2          PICTURE IS X(5).
                    10  FILLER           PICTURE IS X.
                    10  JW-MMH1          PICTURE IS X(5).
                    10  FILLER           PICTURE IS X.
                    10  JW-MMH2          PICTURE IS X(5).
                    10  FILLER           PICTURE IS X.
                    10  JW-NORMU-TIME    PICTURE IS X(5).
                    10  FILLER           PICTURE IS X.
                    10  JW-NORS-TIME     PICTURE IS X(5).
                    10  FILLER           PICTURE IS X.
                    10  JW-AWM-TIME      PICTURE IS X(4).
            FD  JSW     LABEL RECORD IS STANDARD
                        RECORDING MODE IS F
                        BLOCK CONTAINS 60 RECORDS
                        RECORD CONTAINS 111 CHARACTERS.
            01  JSW-RECORD.
                10  JSW-KEY.
                        15  JSW-WU-COD   PICTURE IS X(5).
                        15  JSW-SER-NO   PICTURE IS X(10).
                15  JSW-JCN-DIE PICTURE IS X(5).
                15  JSW=JCN-SE  PICTURE IS XXX.
                15  JSW-JCN-SU  PICTURE IS XX.
            10  FILLER          PICTURE IS X.
            10  JSW-TE-CODE     PICTURE IS XXXX.
            10  FILLER          PICTURE IS X.
            10  JSW-BUR-NO      PICTURE IS X(6).
            10  FILLER          PICTURE IS X.
            10  JSW-ORG-CODE    PICTURE IS XXX.
            10  FILLER          PICTURE IS X.
            10  JSW-ML1-DATE    PICTURE IS XXXXX.
            10  JSW-ML1-DATE-CHK REDEFINES JSW-ML1-DATE.
                15  JSW-ML1-DECADE  PIC 9.
                15  JSW-ML1-YR      PIC X.
                15  JSW-ML1-DAY     PIC XXX.
            10  FILLER          PICTURE IS X.
            10  JSW-ML2-DATE    PICTURE IS XXXXX.
            10  JSW-ML2-DATE-CHK REDEFINES JSW-ML2-DATE.
                15  JSW-ML2-DECADE  PIC 9.
                15  JSW-ML2-YR      PIC X.
                15  JSW-ML2-DAY     PIC XXX.
            10  FILLER          PICTURE IS X.
            10  JSW-ATC1        PICTURE IS X.
            10  FILLER          PICTURE IS X.
            10  JSW-ATC2        PICTURE IS X.
            10  FILLER          PICTURE IS X.
            10  JSW-HMC1        PICTURE IS XXX.
            10  FILLER          PICTURE IS X.
            10  JSW-HMC2        PICTURE IS XXX.
            10  FILLER          PICTURE IS X.
            10  JSW-METER       PICTURE IS XXXX.
            10  FILLER          PICTURE IS X.
            10  JSW-EMT1        PICTURE IS X(5).
            10  FILLER          PICTURE IS X.
            10  JSW-EMT2        PICTURE IS X(5).
            10  FILLER          PICTURE IS X.
            10  JSW-MMH1        PICTURE IS X(5).
            10  FILLER          PICTURE IS X.
            10  JSW-MMH2        PICTURE IS X(5).
            10  FILLER          PICTURE IS X.
            10  JSW-NORMU-TIME  PICTURE IS X(5).
            10  FILLER          PICTURE IS X.
            10  JSW-NORS-TIME   PICTURE IS X(5).
            10  FILLER          PICTURE IS X.
            10  JSW-AWM-TIME    PICTURE IS 9999.
FD  PA-DISK LABEL RECORD IS STANDARD
            RECORDING MODE IS F
            BLOCK CONTAINS 150 RECORDS
            RECORD CONTAINS 35 CHARACTERS.
01  PA-REC.
    05  PA-KEY.
        10  PA-BUR-NO                PIC X(6).
        10  PA-JCN-DATE              PIC X(5).
        10  PA-JCN-SEQ               PIC XXX.
        10  PA-JCN-SUF               PIC XX.
    05  PA-WU-CODE                   PIC X(5).
    05  PA-NORMU-TIME                PIC X(5).
    05  PA-YJRS-TIME                 PIC X(5).
    05  PA-AWM                       PIC 9999.
FD  D-DISK  LABEL RECORD IS STANDARD
            RECORDING MODE IS F
            BLOCK CONTAINS 90  RECORDS
            RECORD CONTAINS 80 CHARACTERS.
01  D-RECORD.
    05  D-KEY.
        10  D-WU=CODE               PIC X(5).
        10  D-SER-NO                PIC X(10).
        10  D-JCN-DATE              PIC X(5).
        10  D-JCN-SEQ               PIC XXX.
        10  D-JCN-SUF               PIC XX.
    05  D-TE-CODE                   PIC XXXX.
    05  D-BUR-NO                    PIC X(6).
    05  D-ORG-CODE                  PIC XXX.
    05  D-ML1-DATE                  PIC X(5).
    05  D-ATC1                      PIC X.
    05  D-HMC1                      PIC XXX.
    05  D-ML2-DATE                  PIC X(5).
```

```
00154           05  D-ATC2                         PIC X.
00155           05  D-HMC2                         PIC XXX.
00156           05  D-METER                        PIC XXXX.
00157           05  D-MMH1                         PIC X(5).
00158           05  D-EMT1                         PIC X(5).
00159           05  D-MMH2                         PIC X(5).
00160           05  D-FMT2                         PIC X(5).
00161       WORKING-STORAGE SECTION.
00162       01  NOM-PA-KEY.
00163           05  NPA-BUR-NO                     PIC X(6).
00164           05  NPA-JCN-DATE                   PIC X(5).
00165           05  NPA-JCN-SEQ                    PIC XXX.
00166           05  NPA-JCN-SUF                    PIC XX.
00167       PROCEDURE DIVISION.
00168                 OPEN INPUT  D-DISK.
00169                 OPEN  I-O  PA-DISK.
00170                 OPEN OUTPUT JW.
00171                 OPEN OUTPUT JSW.
00172       DRIVE-DE.
00173           READ  D-DISK AT END GO TO CLOSE-OUT.
00174                 MOVE D-BUR-NO  TO NPA-BUR-NO.
00175                 MOVE  D-JCN-DATE TO NPA-JCN-DATE.
00176                 MOVE  D-JCN-SEQ  TO NPA-JCN-SEQ.
00177                 MOVE  D-JCN-SUF  TO NPA-JCN-SUF.
00178           READ PA-DISK INVALID KEY DISPLAY
00179                          INVALID KEY FOR PA-FILE =   NOM-PA-KEY
00180                      UPON SYSLST
00181                      GO TO DRIVE-DE.
00192                 MOVE SPACES TO JW-RECORD.
00183                 MOVE SPACES TO JSW-RECORD.
00184                 MOVE  D-WU-CODE    TO JW-WU-CODE, JSW-WU-COD.
00185                 MOVE  D-SER-NO     TO JW-SER-NO, JSW-SER-NO.
00186                 MOVE  D-JCN-DATE   TO JW-JCN-DATE, JSW-JCN-DTE.
00187                 MOVE  D-JCN-SEQ    TO JW-JCN-SEQ, JSW-JCN-SF.
00198                 MOVE  D-JCN-SUF    TO JW-JCN-SUF, JSW-JCN-SU.
00189                 MOVE  D-TE-CODE    TO JW-TE-CODE, JSW-TE-CODE.
00190                 MOVE  D-BUR-NO     TO JW-BUR-NO, JSW-BUR-NO.
00191                 MOVE D-ORG-CODE TO JW-ORG-CODE, JSW-ORG-CODE.
00192                 MOVE  D-ML1-DATE   TO JW-ML1-DATE, JSW-ML1-DATE.
00193                 MOVE  D-ATC1       TO JW-ATC1, JSW-ATC1.
00194                 MOVE  D-HMC1       TO JW-HMC1, JSW-HMC1.
00195                 MOVE  D-ML2-DATE   TO JW-ML2-DATE, JSW-ML2-DATE.
00196                 MOVE  D-ATC2       TO JW-ATC2, JSW-ATC2.
00197                 MOVE  D-HMC2       TO JW-HMC2, JSW-HMC2.
00198                 MOVE  D-METER      TO JW-METER, JSW-METER.
00199                 MOVE  D-MMH1       TO JW-MMH1, JSW-MMH1.
00200                 MOVE  D-EMT1       TO JW-EMT1, JSW-EMT1.
00201                 MOVE  D-MMH2       TO JW-MMH2, JSW-MMH2.
00202                 MOVE  D-EMT2       TO JW-FMT2, JSW-EMT2.
00203                 MOVE PA-NORMU-TIME TO JW-NORMU-TIME, JSW-NORMU-TIME.
00204                 MOVE PA-NORS-TIME TO JW-NORS-TIME, JSW-NORS-TIME.
00205                 MOVE PA-AWM        TO JW-AWM-TIME, JSW-AWM-TIME.
00206           WRITE JW-RECORD INVALID KEY DISPLAY
00207                          INVALID KEY FOR JW-FILE =   JW-KEY
00208                        UPON SYSLST.
00209           WRITE JSW-RECORD INVALID KEY DISPLAY
00210                          INVALID KEY FOR JSW-FILE =   JSW-KEY
00211                        UPON SYSLST.
00212                 GO TO DRIVE-DE.
00213       CLOSE-OUT.
00214                 CLOSE D-DISK.
00215                 CLOSE PA-DISK.
00216                 CLOSE JSW.
00217                 CLOSE JW.
00218                 STOP RUN.
```

```
CBL SXREF,STATE,QUOTE,CLIST,FLOW
       IDENTIFICATION DIVISION.
       PROGRAM-ID. MRG20.
       AUTHOR.  TONY GIRGENTI , ISI.
       ENVIRONMENT DIVISION.
       CONFIGURATION SECTION.
       SOURCE-COMPUTER. IBM-370.
       OBJFCT-COMPUTER. IBM-370.
       INPUT-OUTPUT SECTION.
       FILF-CONTROL.
           SELECT  OUTDSK ASSIGN TO SYS030-DA-3340-S
                   ACCESS MODE IS SEQUENTIAL.
           SELECT  JW  ASSIGN TO SYS031-DA-3340-I
                   ACCESS MODF IS SEQUFNTIAL
                   RECORD KEY IS JW-KEY.   .
       DATA DIVISION.
       FILE SECTION.
       FD  OUTDSK
           LABEL RECORD IS STANDARD
                   RECORDING MODE IS F
                   BLOCK CONTAINS 60 RECORDS
           RECORD CONTAINS 112 CHARACTERS.
       01  MFRGED-RECORD.
           05  FILLER                      PIC X(112).
       FD  JW      LABEL RFCORD IS STANDARD
                   RFCORDING MODE IS F
                   BLOCK CONTAINS 60 RECORDS
                   RECORD CONTAINS 112 CHARACTERS.
       01  JW-REC.
           05  JW-KEY                      PIC X(15).
           05  FILLER                      PIC X(97).
       WORKING-STORAGE SECTION.
       PROCFDURF DIVISION.
                   OPEN INPUT OUTDSK.
                   OPEN OUTPUT JW.
       START-RUN.
           READ OUTDSK INTO JW-REC
                       AT END GO TO END-OF-RUN.
           WRITF  JW-REC INVALID KFY DISPLAY  INVALID KEY =
                                              JW-KEY UPON CONSOLE.
                   GO TO START-RUN.
       END-OF-RUN.
                   CLOSE OUTDSK.
                   CLOSE JW.
           STOP RUN.
```

```
CBL SXREF,CLIST,FLOW,STATE
       IDENTIFICATION DIVISION.
       PROGRAM-ID. MATFILE.
       AUTHOR. INFORMATION SPECTRUM.
       ENVIRONMENT DIVISION.
       CONFIGURATION SECTION.
       SOURCE-COMPUTER. IBM-370.
       OBJECT-COMPUTER. IBM-370.
       INPUT-OUTPUT SECTION.
       FILE-CONTROL.
           SELECT MATRIX-FILE ASSIGN TO SYS029-DA-3340-I
                  ACCESS MODE IS SEQUENTIAL
                  RECORD KEY IS MATRIX-KEY.
           SELECT INPUT-CARD-FILE1 ASSIGN TO SYS007-UR-1442R-S.
           SELECT PRINT-FILE ASSIGN TO SYS008-UR-3203-S.
       DATA DIVISION.
       FILE SECTION.
       FD  MATRIX-FILE LABEL RECORDS ARE STANDARD.
       01  MATRIX-FILE-REC.
           02 MATRIX-KEY                  PIC 9(3).
           02 MATRIX-VALUES               PIC X(300).
           02 MATRIX-IND-VALUES REDEFINES MATRIX-VALUES.
              03 MATRIX-TAB   OCCURS 300 TIMES.
                 04 MATRIX-VAL            PIC X.
       FD  INPUT-CARD-FILE1 LABEL RECORDS ARE OMITTED.
       01  INPUT-FILE1-REC.
           02 FILLER                      PIC X(80).
       FD  PRINT-FILE LABEL RECORDS ARE OMITTED.
       01  PRINT-RECORD.
           02 FILLER                      PIC X(132).
       01  PRINT-REC2.
           05  FILLER                     PIC X(36).
           05  PR2-HEADER.
               10  PR2-HEAD1              PIC X(20).
               10  PR2-HEAD2              PIC X(37).
       01  PRINT-REC3.
           05  FILLER                     PIC X(7).
           05  PR3-TITLE1                 PIC X(9).
           05  FILLER                     PIC X(44).
           05  PR3-TITLE2                 PIC X(11).
           05  FILLER                     PIC X(60).
       01  PRINT-REC4.
           05  FILLER                     PIC X(8).
           05  PR4-CAUS                   PIC ZZZZ.
           05  FILLER                     PIC X(22).
           05  PR4-INDEX    OCCURS 18 TIMES.
               10  PR4-IDX                PIC ZZZZ.
               10  FILLER                 PIC X.
           05  FILLER                     PIC X(8).
       WORKING-STORAGE SECTION.
       77  HDR2 PIC X(37) VALUE ' R E L A T I O N S H I P  M A T R I X'.
       77  MATRIX-TYPE                    PIC X.
       77  PIC-NAME                       PIC X(7) VALUE 'PROGTAB'.
       77  CARD-COUNT                     PIC 9(3).
       77  LN-CTR                         PIC 99.

       01  FT-SWT                         PIC X(3) VALUE ' ON'.
       01  PREV-I                         PIC 9(3).
       01  TEST-ITEMS.
           02 TEST-VALUE                  PIC 9(3).
           02 TEST-VAL    REDEFINES TEST-VALUE    PIC X(3).
       01  INPUT-CARD-REC.
           02 INPUT-I                     PIC 9(3).
           02 TEST-I    REDEFINES INPUT-I    PIC X(3).
           02 FILLER                      PIC X.
           02 INPUT-QTY                   PIC 9(3).
           02 TEST-QTY   REDEFINES INPUT-QTY    PIC X(3).
           02 FILLER                      PIC X.
           02 INPUT-CARD-TABLE    OCCURS 18 TIMES.
              03 FILLER                   PIC X.
              03 INPUT-VALUE              PIC 9(3).
       01  OUTPUT-LINES.
           02 ERR-MESSAGE                 PIC X(33) VALUE
                ' INVALID WRITE TO THE MATRIX FILE'.
           02 ERR-LINE.
              03 FILLER                   PIC X(28) VALUE
                   ' KEY OF THE INVALID WRITE   '.
                03 D-VALUE                  PIC X(3).
                03 FILLER                   PIC X(36) VALUE
                        'POSITION OF THE ITEM IN THE TABLE    '.
                03 D-ITEM                   PIC X(3).
                03 FILLER                   PIC X(62) VALUE SPACE.
 ***
            PROCEDURE DIVISION.
            OPEN-FILES.
                OPEN INPUT INPUT-CARD-FILE1.
                OPEN OUTPUT MATRIX-FILE, PRINT-FILE.
            DISPLAY-AGAIN.
                      DISPLAY '***** WHICH MATRIX (P OR F  )'
                      UPON CONSOLE.
                      ACCEPT MATRIX-TYPE FROM CONSOLE.
            START-MOVES.
                      MOVE SPACES TO PRINT-RECORD.
                      MOVE HDR2 TO PR2-HEAD2.
                IF  MATRIX-TYPE = 'P'
                    MOVE '    P H Y S I C A L ' TO PR2-HEAD1
                    GO TO START-WRITE
                ELSE
                    MOVE 'F U N C T I O N A L ' TO PR2-HEAD1.
                IF  MATRIX-TYPE NOT EQUAL TO 'F'
                    DISPLAY 'YOU DID NOT USE CORRECT ENTRY'
                            UPON CONSOLE
                    GO TO DISPLAY-AGAIN.
            START-WRITE.
                WRITE PRINT-RECORD AFTER POSITIONING 0 LINES.
                      MOVE SPACES TO PRINT-RECORD.
                      MOVE ALL '-' TO PR2-HEADER
                WRITE PRINT-RECORD AFTER POSITIONING 1 LINES.
                      MOVE SPACES TO PRINT-RECORD.
                      MOVE 'CAUSATIVE' TO PR3-TITLE1.
                      MOVE 'SUBJECT WUC' TO PR3-TITLE2.
                WRITE PRINT-RECORD AFTER POSITIONING 2 LINES.
                      MOVE 'WUC INDEX' TO PR3-TITLE1.
                      MOVE '  INDICES   ' TO PR3-TITLE2.
                WRITE PRINT-RECORD AFTER POSITIONING 1 LINES.
                      MOVE ALL '-' TO PR3-TITLE1, PR3-TITLE2.
                WRITE PRINT-RECORD AFTER POSITIONING 1 LINES.
                      MOVE SPACES TO PRINT-RECORD.
                      MOVE ZERO TO LN-CTR.
            START-WRITE-EXIT.
                EXIT.
            READ-INPUT.
                READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC AT END
                                            GO TO END-JOB.
                EXAMINE TEST-QTY REPLACING ALL SPACES BY ZERO.
                IF INPUT-QTY = ZERO PERFORM WRITE-RECORD THRU WRITE-END
                                    GO TO END-JOB.
                EXAMINE TEST-I REPLACING ALL SPACES BY ZERO.
                IF FI-SWT = ' ON' MOVE INPUT-I TO PREV-I
                                  MOVE ZERO TO MATRIX-VALUES
                                  MOVE 'OFF' TO FI-SWT.
                IF INPUT-I NOT = PREV-I PERFORM WRITE-RECORD THRU WRITE-END
                                        MOVE INPUT-I TO PREV-I
                                        MOVE ZERO TO MATRIX-VALUES.
                      MOVE SPACES TO PRINT-RECORD.
                MOVE INPUT-I TO MATRIX-KEY, PR4-CAUS.
                MOVE ZERO TO CARD-COUNT.
            CONT-PROCESS.
                ADD 1 TO CARD-COUNT.
                IF CARD-COUNT IS GREATER THAN INPUT-QTY
                WRITE PRINT-RECORD AFTER POSITIONING 2 LINES
                    ADD 1 TO LN-CTR
                    PERFORM TOP-OF-PAGE
                                  GO TO READ-INPUT.
                MOVE INPUT-VALUE (CARD-COUNT) TO TEST-VALUE,
                      PR4-IDX (CARD-COUNT).
                EXAMINE TEST-VAL REPLACING ALL SPACES BY ZERO.
                MOVE 1 TO MATRIX-VAL (TEST-VALUE).
                GO TO CONT-PROCESS.
            END-JOB.
                CLOSE INPUT-CARD-FILE1,
                      MATRIX-FILE, PRINT-FILE.
                STOP RUN.
 ***
```

```
      3         MATFILE          13.34.08          10/18/78

***
***
           WRITE-RECORD.
               WRITE MATRIX-FILE-REC INVALID KEY
                                     MOVE INPUT-I TO D-VALUE
                                     MOVE TEST-VALUE TO D-ITEM
                                     WRITE PRINT-RECORD FROM ERR-MESSAGE
                                           AFTER POSITIONING 2 LINES
                                     WRITE PRINT-RECORD FROM ERR-LINE
                                           AFTER POSITIONING 2 LINES.
           WRITE-END.
               EXIT.
           TOP-OF-PAGE.
               IF  LN-CTR IS GREATER THAN 35
                   PERFORM START-MOVES THRU START-WRITE-EXIT.
```

```
1   IBM DOS VS COBOL                              REL 2.4 • PTF28  PP NO. 5746-CB1                    21.53.57  11/20/78

 CBL  SXREF,STATE,CLIST,FLOW
                IDENTIFICATION DIVISION.
                PROGRAM-ID.  KEYLIST.
                AUTHOR.  TONY GIRGENTI , ISI.
                ENVIRONMENT DIVISION.
                CONFIGURATION SECTION.
                SOURCE-COMPUTER. IBM-370.
                OBJECT-COMPUTER. IBM-370.
                INPUT-OUTPUT SECTION.
                FILE-CONTROL.
                    SELECT  KEYLIST-FILE ASSIGN TO SYS031-DA-3340-I
                            ACCESS MODE IS SEQUENTIAL
                            RECORD KEY IS KEYLIST-KEY.
                    SELECT KEYLIST-FILE2 ASSIGN TO SYS032-DA-3340-I
                            ACCESS MODE IS SEQUENTIAL
                            RECORD KEY IS KEYLIST-KEY2.
                DATA DIVISION.
                FILE SECTION.
                FD  KEYLIST-FILE LABEL RECORDS ARE STANDARD
                            RECORDING MODE IS F
                            BLOCK CONTAINS  500 RECORDS
                            RECORD CONTAINS 16  CHARACTERS.
                01  KEYLIST-REC.
                    02 KEYLIST-KEY                PIC X(16).
                FD  KEYLIST-FILE2 LABEL RECORDS ARE STANDARD
                            RECORDING MODE IS F
                            BLOCK CONTAINS  500 RECORDS
                            RECORD CONTAINS 16  CHARACTERS.
                01  KEYLIST-REC2.
                    02 KEYLIST-KEY2               PIC X(16).
                WORKING-STORAGE SECTION.
                77  CREATE-KEY          PIC X(16) VALUE '9999999999999999'.
                PROCEDURE DIVISION.
                    OPEN OUTPUT KEYLIST-FILE KEYLIST-FILE2.
                    MOVE CREATE-KEY TO KEYLIST-KEY KEYLIST-KEY2.
                    WRITE KEYLIST-REC2 INVALID KEY DISPLAY 'INVALID KEY = '
                                                   KEYLIST-KEY2 UPON SYSLST.
                    WRITE KEYLIST-REC INVALID KEY DISPLAY 'INVALID KEY = '
                                                   KEYLIST-KEY UPON SYSLST.
                            CLOSE KEYLIST-FILE KEYLIST-FILE2.
                    STOP RUN.
```

```
  1   IBM DOS VS COBOL                          REL 2.4 + PTF29  PP NO. 5746-CB1                  18.35.11  01/19/79

   CBL SXREF,CLIST,FLOW,STATE
   00001           IDENTIFICATION DIVISION.
   00002           PROGRAM-ID. PROG3A.
   00003           AUTHOR. INFORMATION SPECTRUM.
   00004           ENVIRONMENT DIVISION.
   00005           CONFIGURATION SECTION.
   00006           SOURCE-COMPUTER. IBM-370.
   00007           OBJECT-COMPUTER. IBM-370.
   00008           INPUT-OUTPUT SECTION.
   00009           FILE-CONTROL.
   00010               SELECT JW-FILE ASSIGN TO SYS032-DA-3340-I
   00011                      ACCESS MODE IS SEQUENTIAL
   00012                      NOMINAL KEY IS JW-NOMINAL-KEY
   00013                      RECORD KEY IS JW-KEY.
   00014               SELECT JB-FILE ASSIGN TO SYS033-DA-3340-I
   00015                      ACCESS MODE IS SEQUENTIAL
   00016                      NOMINAL KEY IS JB-NOMINAL-KEY
   00017                      RECORD KEY IS JB-KEY.
   00018               SELECT MATRIX-FILE ASSIGN TO SYS029-DA-3340-I
   00019                      ACCESS MODE IS RANDOM
   00020                      NOMINAL KEY IS MATRIX-NOMINAL-KEY
   00021                      RECORD KEY IS MATRIX-KEY.
   00022               SELECT INPUT-CARD-FILE1 ASSIGN TO SYS007-UR-1442R-S.
   00023               SELECT PRINT-FILE ASSIGN TO SYS008-UR-3203-S.
   00024               SELECT S-FILE ASSIGN TO SYS034-DA-3340-S.
   00025               SELECT  2A-LIST-FILE ASSIGN TO SYS030-DA-3340-I
   00026                       ACCESS MODE IS RANDOM
   00027                       NOMINAL KEY IS 2A-NOM-KEY
   00028                       RECORD KEY IS 2A-REC-KEY.
   00029               SFLECT  T-LIST-FILE ASSIGN TO SYS031-DA-3340-I
   00030                       ACCESS MODE IS RANDOM
   00031                       NOMINAL KEY IS T-NOM-KEY
   00032                       RECORD KEY IS T-REC-KEY.
   00033           DATA DIVISION.
   00034           FILE SECTION.
   00035           FD  INPUT-CARD-FILE1 LABEL RECORDS ARE OMITTED.
   00036           01  INPUT-FILE1-REC.
   00037               02 FILLER                          PIC X(80).
   00038           FD  T-LIST-FILE  LABEL RECORDS STANDARD
   00039                       RECORDING MODE IS F
   00040                       BLOCK CONTAINS  500 RECORDS
   00041                       RECORD CONTAINS 16  CHARACTERS.
   00042           01  T-LIST-REC.
   00043               02  T-REC-KEY.
   00044                   03  T-REC-BN               PIC 9(6).
   00045                   03  T-REC-JCN.
   00046                       04  T-REC-YR           PIC 99.
   00047                       04  T-REC-DAY          PIC 999.
   00048                       04  T-REC-SEQ          PIC 999.
   00049                       04  T-REC-SUF          PIC XX.
   00050           FD  2A-LIST-FILE  LABEL RECORDS STANDARD
   00051                       RECORDING MODE IS F
   00052                       BLOCK CONTAINS  500 RECORDS
   00053                       RECORD CONTAINS 16  CHARACTERS.
   00054           01  2A-LIST-REC.
   00055               02  2A-REC-KEY.
   00056                   03  2A-REC-BN              PIC 9(6).
   00057                   03  2A-REC-JCN.
   00058                       04  2A-REC-YR          PIC 99.
   00059                       04  2A-REC-DAY         PIC 999.
   00060                       04  2A-REC-SEQ         PIC 999.
   00061                       04  2A-REC-SUF         PIC XX.
   00062           FD  S-FILE LABEL RECORDS ARE STANDARD
   00063               BLOCK CONTAINS  50 RECORDS.
   00064           01  S-RECORD.
   00065               02 S-KEY.
   00066                   03 S-KEY-BUREAU-NUMBER  PIC 9(6).
   00067                   03 S-KEY-JCN.
   00068                       04 S-KEY-JCN-DATE         PIC 9(5).
   00069                       04 S-KEY-JCN-SEQUENCE     PIC 9(3).
   00070                       04 S-KEY-JCN-SUFFIX       PIC 9(2).
   00071               02 S-INDEX                     PIC 9(3).
   00072               02 S-MMH-VALUE                 PIC 9(6).
   00073               02 S-MU-VALUE                  PIC 9(6).
   00074               02 S-S-VALUE                   PIC 9(6).
   00075               02 S-AWM-VALUE                 PIC 9(5).
   00076           FD  PRINT-FILE LABEL RECORDS ARE OMITTED.
```

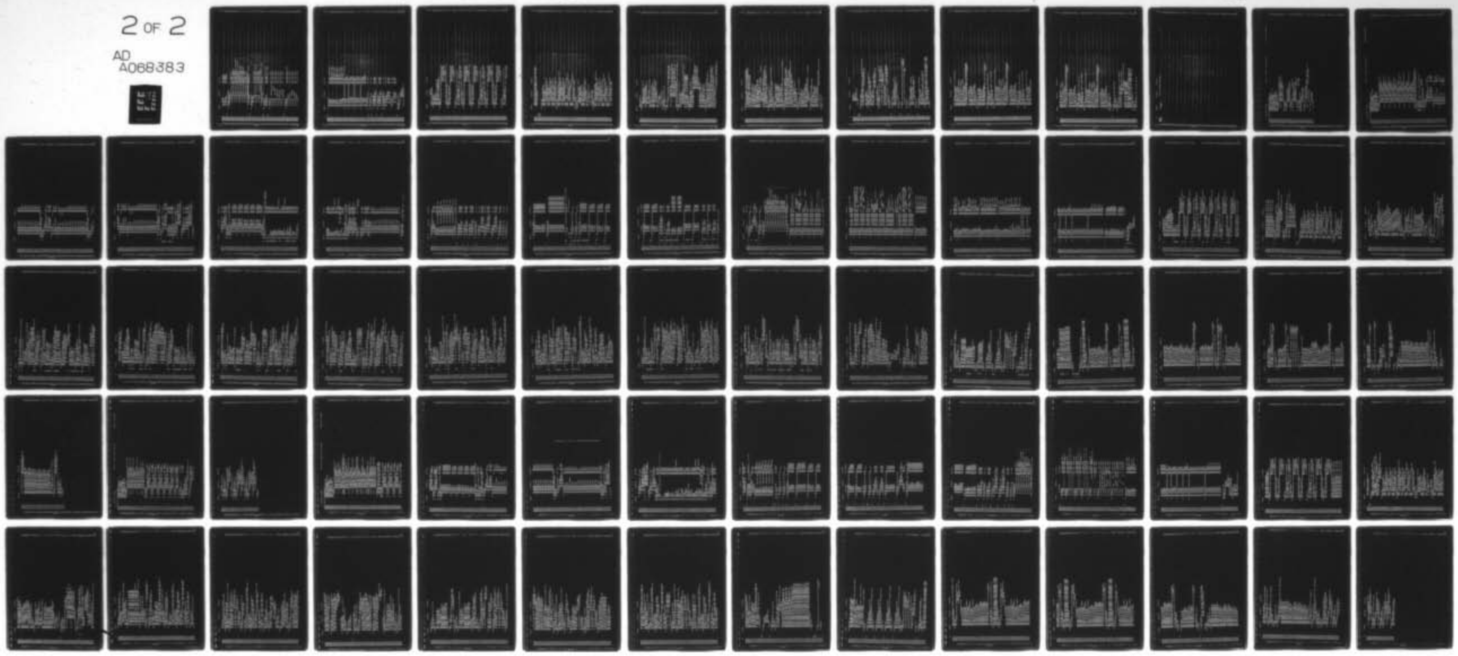
```
01  PRINT-RECORD.
    02 PRINT-LINE                PIC X(132).
FD  MATRIX-FILE LABEL RECORDS ARE STANDARD.
01  MATRIX-FILE-REC.
    02 MATRIX-KEY                PIC 9(3).
    02 MATRIX-TAB OCCURS 300 TIMES.
       03 MATRIX-VAL             PIC X.
FD  JW-FILE LABEL RECORDS ARE STANDARD
       BLOCK CONTAINS 60 RECORDS.
01  JW-RECORD.
    02 JW-KEY.
       03 JW-WU-CODE             PIC X(5).
       03 JW-JCN.
          04 JW-JCN-NUM.
             05 JW-JCN-DATE.
                  06 JW-JCN-YR       PIC 9(2).
                  06 JW-JCN-DAY      PIC 9(3).
             05 JW-JCN-SEQUENCE     PIC 9(3).
          04 JW-JCN-SUFFIX       PIC X(2).
    02 REST-OF-JW.
       03 FILLER                 PIC X.
       03 JW-TE-CODE             PIC X(4).
       03 FILLER                 PIC X.
       03 JW-BUREAU-NUMBER       PIC 9(6).
       03 FILLER                 PIC X.
       03 JW-SERIAL-NUMBER       PIC X(10).
       03 FILLER                 PIC X.
       03 JW-ORG-CODE            PIC X(3).
       03 FILLER                 PIC X.
       03 JW-ML1-DATE            PIC 9(5).
       03 FILLER                 PIC X.
       03 JW-ML2-DATE            PIC 9(5).
       03 FILLER                 PIC X.
       03 JW-ATC-LEVEL1          PIC X.
       03 FILLER                 PIC X.
       03 JW-ATC-LEVEL2          PIC X.
       03 FILLER                 PIC X.
       03 JW-HMC-LEVEL1          PIC 9(3).
       03 FILLER                 PIC X.
       03 JW-HMC-LEVEL2          PIC 9(3).
       03 FILLER                 PIC X.
       03 JW-METER-TIME          PIC 9(4).
       03 FILLER                 PIC X.
       03 JW-EMT-LEVEL1          PIC 9(5).
       03 FILLER                 PIC X.
       03 JW-EMT-LEVEL2          PIC 9(5).
       03 FILLER                 PIC X.
       03 JW-MMH-LEVEL1          PIC 9(5).
       03 FILLER                 PIC X.
       03 JW-MMH-LEVEL2          PIC 9(5).
       03 FILLER                 PIC X.
       03 JW-NORMU-TIME          PIC 9(5).
       03 FILLER                 PIC X.
       03 JW-NORS-TIME           PIC 9(5).
       03 FILLER                 PIC X.
       03 JW-AWM-TIME            PIC 9(4).
FD  JB-FILE LABEL RECORDS ARE STANDARD
       BLOCK CONTAINS 70 RECORDS.
01  JB-RECORD.
    02 JB-KEY.
       03 JB-BUREAU-NUMBER       PIC 9(6).
       03 JB-JCN.
          04 JB-JCN-NUM.
             05 JB-JCN-DATE         PIC 9(5).
             05 JB-JCN-SEQUENCE     PIC 9(3).
          04 JB-JCN-SUFFIX       PIC X(2).
    02 REST-OF-JB.
       03 FILLER                 PIC X.
       03 JB-TE-CODE             PIC X(4).
       03 FILLER                 PIC X.
       03 JB-WU-CODE             PIC X(5).
       03 FILLER                 PIC X.
       03 JB-SERIAL-NUMBER       PIC X(10).
       03 FILLER                 PIC X.
       03 JB-ORG-CODE            PIC X(3).
       03 FILLER                 PIC X.
       03 JB-ML1-DATE            PIC 9(5).
```

```
00154                   03 FILLER              PIC X.
00155                   03 JB-ML2-DATE         PIC 9(5).
00156                   03 FILLER              PIC X.
00157                   03 JB-ATC-LEVEL1       PIC X.
00158                   03 FILLER              PIC X.
00159                   03 JB-ATC-LEVEL2       PIC X.
00160                   03 FILLER              PIC X.
00161                   03 JB-HMC-LEVEL1       PIC 9(3).
00162                   03 FILLER              PIC X.
00163                   03 JB-HMC-LEVEL2       PIC 9(3).
00164                   03 FILLER              PIC X.
00165                   03 JB-METER-TIME       PIC 9(4).
00166                   03 FILLER              PIC X.
00167                   03 JB-EMT-LEVEL1       PIC 9(5).
00168                   03 FILLER              PIC X.
00169                   03 JB-EMT-LEVEL2       PIC 9(5).
00170                   03 FILLER              PIC X.
00171                   03 JB-MMH-LEVEL1       PIC 9(5).
00172                   03 FILLER              PIC X.
00173                   03 JB-MMH-LEVEL2       PIC 9(5).
00174                   03 FILLER              PIC X.
00175                   03 JB-NORMU-TIME       PIC 9(5).
00176                   03 FILLER              PIC X.
00177                   03 JB-NORS-TIME        PIC 9(5).
00178                   03 FILLER              PIC X.
00179                   03 JB-AWM-TIME         PIC 9(4).
00180           WORKING-STORAGE SECTION.
00181           77  HOR1     PIC X(29) VALUE 'D I S P L A Y   O F   I N P U T'.
00182           77  PIC-NAME                   PIC X(10) VALUE 'PROGRAM-3A'.
00183           77  BUFF-KEY                   PIC 9(6).
00184           77  I                          PIC 9(3).
00185           77  J                          PIC 9(3).
00186           77  K                          PIC 999.
00187           77  L                          PIC 9(3).
00188           77  ERR-IDX                    PIC 9(2).
00189           77  NSWUC                      PIC 9(3).
00190           77  NPWUC                      PIC 9(3).
00191           77  NFDWUC                     PIC 9(3).
00192           77  CARD-COUNT                 PIC 9(5).
00193           77  FOUND-SWT                  PIC X(3).
00194           77  DATE-DIFF                  PIC S9(5) TRAILING.
00195           77  BUNOKEY                    PIC 9(6).
00196           77  T-SWITCH                   PIC X(3).
00197           77  PWUC-SWT                   PIC X.
00198           77  2A-SWT                     PIC X.
00199           77  2A-IDX                     PIC 9(3).
00200           77  T                          PIC 9(3).
00201           77  OUT-COUNT                  PIC 9(2).
00202           77  LINE-COUNT                 PIC 9(3).
00203           77  PREV-4DIGIT-WUC            PIC X(4).
00204           77  WUC-4DIGIT                 PIC X(4).
00205           77  INDX1                      PIC 9(3).
00206           77  INDX2                      PIC 9(3).
00207           77  INDX3                      PIC 9(3).
00208           77  BIN-DIFF                   PIC S9(3) TRAILING.
00209           77  SUB-1-DATE                 PIC 9(5).
00210           77  SUB-2-DATE                 PIC 9(5).
00211           77  YR-DIFF                    PIC 9(2).
00212           77  INTEGER-YR                 PIC 9(2).
00213           77  CTRR             PIC 9(6)  VALUE 1000.
00214           77  REC-CNT          PIC 9(6)  VALUE ZEROS.
00215
00216           01  INPUT-CARD-REC1.
00217               02 INPUT-VALUE1            PIC 9(3).
00218               02 INPUT-VALUE1E REDEFINES INPUT-VALUE1   PIC X(3).
00219           01  INPUT-CARD-REC2.
00220               02 INPUT-REC2 OCCURS 11 TIMES.
00221                   03 INPUT-VALUE2        PIC X(5).
00222                   03 FILLER              PIC X(2).
00223           01  INPUT-CARD-REC3.
00224               02 INPUT-REC3 OCCURS 8 TIMES.
00225                   03 FILLER              PIC X(2).
00226                   03 INPUT-VALUE3        PIC 9(6)V99.
00227           01  TEST-TABLE.
00228               02 TEST-COST-VALUE         PIC 9(6)V99.
00229               02 TEST-COST   REDEFINES TEST-COST-VALUE   PIC X(8).
00230               02 TEST-VALUE              PIC 9(3).
```

```
           02 TEST-VAL   REDEFINES TEST-VALUE   PIC X(3).
 ***
       01  SWUC-TABLE.
           02 SWUC-TAB OCCURS 300 TIMES.
                03 SWUC                       PIC X(5).
 ***
       01  PWUC-TABLE.
           02 PWUC-TAB OCCURS 300 TIMES.
                03 PWUC                       PIC X(5).
 ***
       01  LCOST-TABLE.
           02 LCOST-TAB OCCURS  50 TIMES COMP-3.
                03 LCOST                      PIC 9(6)V99.
 ***
       01  JCNKEY.
           02 JCNKEY-NUM.
                03 JCNKEY-DATE.
                     04 JCNKEY-YR             PIC 9(2).
                     04 JCNKEY-DAY            PIC 9(3).
                03 JCNKEY-SEQUENCE            PIC 9(3).
           02 JCNKEY-SUFFIX                   PIC X(2).
 ***
       01  A1-COST-TABLE.
           02 A1-COST-TAB OCCURS 300 TIMES COMP-3.
                03 A1ACT                      PIC 9(3).
                03 A1MMH                      PIC 9(7)V9.
                03 A1MU                       PIC 9(7)V9.
                03 A1S                        PIC 9(7)V9.
                03 A1AWM                      PIC 9(7)V9.
 ***
       01  A2-COST-TABLE.
           02 A2-COST-TAB OCCURS 300 TIMES COMP-3.
                03 A2ACT                      PIC 9(3).
                03 A2MMH                      PIC 9(7)V9.
                03 A2MU                       PIC 9(7)V9.
                03 A2S                        PIC 9(7)V9.
                03 A2AWM                      PIC 9(7)V9.
 ***
       01  HOLD-TABLE.
           02 HOLD-BN                         PIC 9(6).
           02 HOLD-JCN.
                03 HOLD-JCN-DATE              PIC 9(5).
                03 HOLD-JCN-SEQUENCE          PIC 9(3).
                03 HOLD-JCN-SUFFIX            PIC X(2).
 ***
       01  T-COST-TABLE.
           02 T-COST-TAB OCCURS 300 TIMES COMP-3.
                03 TACT                       PIC 9(4).
                03 TMMH                       PIC 9(7)V9.
                03 TMU                        PIC 9(7)V9.
                03 TS                         PIC 9(7)V9.
                03 TAWM                       PIC 9(7)V9.
 ***
       01  LABOR-COST-TABLE.
           02 LABOR-COST-TAB OCCURS 300 TIMES COMP-3.
                03 A1LCST                     PIC 9(8)V99.
                03 A2LCST                     PIC 9(8)V99.
                03 SLCOST                     PIC 9(8)V99.
                03 TLCOST                     PIC 9(8)V99.
 ***
       01  BUFFER-TABLE.
           02 BUFFR1                          PIC 9(5).
           02 BUFFR2                          PIC 9(5).
           02 BUFFR3                          PIC 9(5).
           02 BUFFR4                          PIC 9(4).
 ***
       01  S-COST-TABLE.
           02 S-COST-TAB OCCURS 300 TIMES COMP-3.
                03 SACT                       PIC 9(3).
                03 SMMH                       PIC 9(7)V9.
                03 SMU                        PIC 9(7)V9.
                03 SS                         PIC 9(7)V9.
                03 SAWM                       PIC 9(7)V9.
 ***
 ***
       01  TOTAL-TABLE.
           02 TOT-ACT                         PIC 9(4).
```

AD-A068 383 INFORMATION SPECTRUM INC WARMINSTER PA F/G 1/3
MAINTENANCE IMPROVEMENT: AN ANALYSIS APPROACH INCLUDING INFEREN--ETC(U)
MAR 79 M CLYMAN, V A GENTILE, P S GRENETZ MDA903-78-C-0176
UNCLASSIFIED ISI-W-7958-02D NI

2 OF 2
AD
A068383



END
DATE
FILMED
6-79
DDC

```
               02 TOT-MMH                    PIC 9(8)V9.
               02 TOT-NU                     PIC 9(8)V9.
               02 TOT-S                      PIC 9(8)V9.
               02 TOT-AWM                    PIC 9(8)V9.
               02 TOT-LABOR                  PIC 9(8)V99.
      ***
           01  ERROR-MESSAGE-TABLE.
               02 ERROR-MESSAGE.
                  03 FILLER                  PIC X(45) VALUE
                        'INPUT VALUES ARE MISSING                     '.
                  03 FILLER                  PIC X(45) VALUE
                        'NUMBER OF WU-CODES IS 1 SPECIFIED            '.
                  03 FILLER                  PIC X(45) VALUE
                        'RANGE VALUE OF CAUSATIVE WU-CODES IS MISSING '.
                  03 FILLER                  PIC X(45) VALUE
                        'NUMBER OF CAUSATIVE WU-CODES IS 1 SPECIFIED  '.
                  03 FILLER                  PIC X(45) VALUE
                        'RANGE VALUE OF LABOR=COSTS IS MISSING        '.
                  03 FILLER                  PIC X(45) VALUE
                        'NUMBER OF LABORS-COSTS IS 1 SPECIFIED        '.
                  03 FILLER                  PIC X(45) VALUE
                        'INPUT FUNC RELATIONS IS 1 SPECIFIED          '.
                  03 FILLER                  PIC X(45) VALUE
                        'INVALID WRITE TO S-FILE                      '.
                  03 FILLER                  PIC X(45) VALUE
                        'INVALID READ OF MATRIX-FILE                  '.
               02 ERR-TAB REDEFINES ERROR-MESSAGE OCCURS 9 TIMES.
                  03 ERR-MSG                 PIC X(45).
      ***
           01  HEADING-TABLE.
               02 HEAD-TAB.
                  03 FILLER                  PIC X(37) VALUE
                        'O - L E V E L   F A L S E   A L A R M S'.
                  03 FILLER                  PIC X(37) VALUE
                        'I - L E V E L   F A L S E   A L A R M S'.
                  03 FILLER                  PIC X(37) VALUE
                        '      A C C E S S   A C T I O N S      '.
                  03 FILLER                  PIC X(37) VALUE
                        '    C A N N I B A L I Z A T I O N S    '.
               02 HEADING-TITLES REDEFINES HEAD-TAB  OCCURS 4 TIMES.
                  03 HEAD-TITLE              PIC X(37).
      ***
           01  HEADING-1.
               02 FILLER                     PIC X(48) VALUE SPACE.
               02 OUT-HEADING                PIC X(37).
               02 FILLER                     PIC X(47) VALUE SPACE.
      ***
           01  HEADING-2.
               02 FILLER                     PIC X(20) VALUE
                     '     WORK-UNIT CODE '.
               02 FILLER                     PIC X(20) VALUE
                     '          ACTION    '.
               02 FILLER                     PIC X(20) VALUE
                     '        MMH=TIME    '.
               02 FILLER                     PIC X(20) VALUE
                     '    NORMU-TIME      '.
               02 FILLER                     PIC X(15) VALUE
                     ' NORS-TIME     '.
               02 FILLER                     PIC X(20) VALUE
                     '      AWM-TIME      '.
               02 FILLER                     PIC X(17) VALUE
                     ' LABOR COST      '.
      ***
           01  HEADING-3.
               02 FILLER                     PIC X(30) VALUE SPACE.
               02 FILLER                     PIC X(15) VALUE
                     '(QTY)          '.
               02 FILLER                     PIC X(15) VALUE
                     ' (HOURS)       '.
               02 FILLER                     PIC X(20) VALUE
                     '      (HOURS)       '.
               02 FILLER                     PIC X(20) VALUE
                     '   (HOURS)          '.
               02 FILLER                     PIC X(20) VALUE
                     '(HOURS)             '.
               02 FILLER                     PIC X(12) VALUE
                     '($)        '.
```

```
00385 ***
00386          01  DETAIL-LINE.
00387              02 FILLER                    PIC X(9)  VALUE SPACE.
00388              02 D-WUC                     PIC X(5).
00389              02 FILLER                    PIC X(14) VALUE SPACE.
00390              02 D-ACT                     PIC Z(3)9.
00391              02 FILLER                    PIC X(11) VALUE SPACE.
00392              02 D-MMH                     PIC Z(8).9.
00393              02 FILLER                    PIC X(9)  VALUE SPACE.
00394              02 D-MU                      PIC Z(8).9.
00395              02 FILLER                    PIC X(8)  VALUE SPACE.
00396              02 D-S                       PIC Z(8).9.
00397              02 FILLER                    PIC X(7)  VALUE SPACE.
00398              02 D-AWM                     PIC Z(8).9.
00399              02 FILLER                    PIC X(8)  VALUE SPACE.
00400              02 D-LABOR                   PIC Z(8).99.
00401              02  FILLER                   PIC X(6)  VALUE SPACE.
00402          01  DETAIL-LINE2 REDEFINES DETAIL-LINE.
00403              05  FILLER                   PIC X(51).
00404              05  D-HDR                    PIC X(29).
00405              05  FILLER                   PIC X(52).
00406          01  DETAIL-LINE3 REDEFINES DETAIL-LINE.
00407              05  FILLER                   PIC X(7).
00408              05  D-TITLE1'                PIC X(14).
00409              05  D-DATA5                  PIC X(2).
00410              05  D-TITLE2                 PIC X(24).
00411              05  FILLER                   PIC X(85).
00412          01  DETAIL-LINE4 REDEFINES DETAIL-LINE.
00413              05  FILLER                   PIC X(10).
00414              05  D-DATA1                  PIC ZZZ.
00415              05  FILLER                   PIC X(42).
00416              05  D-DATA2                  PIC X(5).
00417              05  FILLER                   PIC X(72).
00418          01  DETAIL-LINES REDEEINES DETAIL-LINE.
00419              05  FILLER                   PIC X(10).
00420              05  D-DATA3                  PIC XXXX.
00421              05  FILLER                   PIC X(39).
00422              05  D-DATA4                  PIC ZZZZZZ.99.
00423              05  FILLER                   PIC X(70).
00424          01  GEN-JW-KEY.
00425              02 GEN-JW-KEY-WUC            PIC X(5).
00426 ***
00427          01  GEN-JB-KEY.
00428              02 GEN-JB-KEY-BN             PIC 9(6).
00429 ***
00430          01  JW-NOMINAL-KEY.
00431              02 JW-NOM-WUC                PIC X(5).
00432              02 JW-NOM-JCN-NUM            PIC 9(8).
00433              02 JW-NOM-JCN-SUFFIX         PIC X(2).
00434 ***
00435          01  JB-NOMINAL-KEY.
00436              02 JB-NOM-BN                 PIC 9(6).
00437              02 JB-NOM-JCN-NUM            PIC 9(8).
00438              02 JB-NOM-JCN-SUFFIX         PIC X(2).
00439 ***
00440          01  MATRIX-NOMINAL-KEY.
00441              02 MATRIX-NOM-KEY            PIC 9(3).
00442          01  2A-NOM-KEY.
00443              02  2A-BUR-NO                PIC 9(6).
00444              02 ,2A-JCN-DATA.
00445                  03  2A-JCN-DATE          PIC 9(5).
00446                  03  2A-JCN-SEQ           PIC 999.
00447                  03  2A-JCN-SUF           PIC XX.
00448          01  T-NOM-KEY.
00449              02  T-BUR-NO                 PIC 9(6).
00450              02  T-JCN.
00451                  03  T-JCN-DATE           PIC 9(5).
00452                  03  T-JCN-SEQ            PIC 999.
00453                  03  T-JCN-SUF            PIC XX.
00454 ***
00455          PROCEDURE DIVISION.
00456          OPEN-FILES.
00457              OPEN INPUT  JW-FILE
00458                          JB-FILE
00459                          MATRIX-FILE
00460                          INPUT-CARD-FILE1.
00461              OPEN OUTPUT PRINT-FILE
```

```
                S-FILE.
    OPEN I-O T-LIST-FILE.
    OPEN I-O 2A-LIST-FILE.
INITIALIZE-PROG.
    MOVE ZERO TO I.
    MOVE ZERO TO J.
    MOVE ZERO TO L.
    MOVE LOW-VALUE TO JW-NOMINAL-KEY.
    MOVE LOW-VALUE TO JB-NOMINAL-KEY.
    MOVE LOW-VALUE TO MATRIX-NOMINAL-KEY.
READ-NSWUC.
    READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC1 AT END
                                  MOVE 01 TO ERR-IDX
                                  PERFORM ERR-RTN THRU
                                          ERR-RTN-EXIT
                                  GO TO END-JOB.
    EXAMINE INPUT-VALUE1E REPLACING ALL SPACES BY ZERO.
    MOVE INPUT-VALUE1 TO NSWUC.
READ-SWUC.
    MOVE ZERO TO CARD-COUNT.
    READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC2 AT END
                                  MOVE 02 TO ERR-IDX
                                  PERFORM ERR-RTN THRU
                                          ERR-RTN-EXIT
                                  GO TO END-JOB.
SWUC=INCR-J.
    ADD 1 TO J.
    IF J IS GREATER THAN NSWUC GO TO READ-NPWUC.
    ADD 1 TO CARD-COUNT.
    IF CARD-COUNT IS GREATER THAN 11 SUBTRACT 1 FROM J
                                      GO TO READ-SWUC.
    MOVE INPUT-VALUE2 (CARD-COUNT) TO SWUC (J).
    GO TO SWUC-INCR-J.
READ=NPWUC.
    READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC1 AT END
                                  MOVE 03 TO ERR-IDX
                                  PERFORM ERR-RTN THRU
                                          ERR-RTN-EXIT
                                  GO TO END-JOB.
    EXAMINE INPUT-VALUE1E REPLACING ALL SPACES BY ZERO.
    MOVE INPUT-VALUE1 TO NPWUC.
READ=PWUC.
    MOVE ZERO TO CARD-COUNT.
    READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC2 AT END
                                  MOVE 04 TO ERR-IDX
                                  PERFORM ERR-RTN THRU
                                          ERR-RTN-EXIT
                                  GO TO END-JOB.
PWUC-INCR-I.
    ADD 1 TO I.
    IF I IS GREATER THAN NPWUC GO TO READ-NFDWUC.
    ADD 1 TO CARD-COUNT.
    IF CARD-COUNT IS GREATER THAN 11 SUBTRACT 1 FROM I
                                      GO TO READ-PWUC.
    MOVE INPUT-VALUE2 (CARD-COUNT) TO PWUC (I).
    GO TO PWUC-INCR-I.
READ-NFDWUC.
    READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC1 AT END
                                  MOVE 05 TO ERR-IDX
                                  PERFORM ERR-RTN THRU
                                          ERR-RTN-EXIT
                                  GO TO END-JOB.
    EXAMINE INPUT-VALUE1E REPLACING ALL SPACES BY ZERO.
    MOVE INPUT-VALUE1 TO NFDWUC.
READ-LCOST.
    MOVE ZERO TO CARD-COUNT.
    READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC3 AT END
                                  MOVE 06 TO ERR-IDX
                                  PERFORM ERR-RTN THRU
                                          ERR-RTN-EXIT
                                  GO TO END-JOB.
LCOST-INCR-L.
    ADD 1 TO L.
    IF L IS GREATER THAN NFDWUC GO TO TOP-OF-PAGE.
    ADD 1 TO CARD-COUNT.
    IF CARD-COUNT IS GREATER THAN 8 SUBTRACT 1 FROM L
                                      GO TO READ-LCOST.
```

```
           MOVE INPUT-VALUE3 (CARD-COUNT) TO TEST-COST-VALUE.
           EXAMINE TEST-COST REPLACING ALL SPACES BY ZERO.
           MOVE TEST-COST-VALUE TO LCOST (L).
           GO TO LCOST-INCR-L.
 ***
 ***
 ***
       TOP-OF-PAGE.
           MOVE ZERO TO LINE-COUNT.
           MOVE SPACES TO DETAIL-LINE.
           MOVE HDR1 TO D-HDR.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 0 LINES.
           MOVE SPACES TO DETAIL-LINE.
           MOVE ALL '-' TO D-HDR.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 1 LINES.
           MOVE SPACES TO DETAIL-LINE.
           MOVE 'SUBJECT WUC = ' TO D-TITLE1.
           MOVE SWUC (1) TO D-DATA5.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 3 LINES.
       PWUC-HEADER.
           MOVE SPACES TO DETAIL-LINE.
           MOVE 'PHYSICAL WORK UNIT CODES' TO D-TITLE2.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 2 LINES.
           MOVE ALL '-' TO D-TITLE2.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 1 LINES.
           MOVE SPACES TO DETAIL-LINE.
           MOVE '  INDEX          ' TO D-TITLE1.
           MOVE '     WUC                    ' TO D-HDR.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 2 LINES.
           MOVE SPACES TO DETAIL-LINE.
           MOVE '  -----          ' TO D-TITLE1.
           MOVE '     -----                  ' TO D-HDR.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 1 LINES.
       TOP-OF-PAGE-END.
           MOVE 1 TO I.
       PWUC-PRINT.
           IF  LINE-COUNT IS GREATER THAN 30
               PERFORM TOP-OF-PAGE
               PERFORM  PWUC-HEADER.
           MOVE SPACES TO DETAIL-LINE.
           MOVE I TO D-DATA1.
           MOVE PWUC (I) TO D-DATA2.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 2 LINES.
           ADD 1 TO LINE-COUNT.
           ADD 1 TO I.
           IF  I IS GREATER THAN NPWUC
               NEXT SENTENCE
           ELSE
               GO TO PWUC-PRINT.
           PERFORM TOP-OF-PAGE.
       LCOST-HEADER.
           MOVE SPACES TO DETAIL-LINE.
           MOVE '  LABOR RATES ($/HOUR)  ' TO D-TITLE2.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 2 LINES.
           MOVE ALL '-' TO D-TITLE2.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 1 LINES.
           MOVE SPACES TO DETAIL-LINE.
           MOVE 'FOUR-DIGIT-WUC' TO D-TITLE1.
           MOVE '     RATES                  ' TO D-HDR.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 2 LINES.
           MOVE SPACES TO DETAIL-LINE.
           MOVE ALL '-' TO D-TITLE1.
           MOVE '     -----                  ' TO D-HDR.
           WRITE PRINT-RECORD FROM DETAIL-LINE
                 AFTER POSITIONING 1 LINES.
           MOVE SPACES TO PREV-4DIGIT-WUC.
```

```
    MOVE ZERO TO K.
    MOVE 1 TO I.
LCOST-PRINT.
    IF   LINE-COUNT IS GREATER THAN 30
         PERFORM TOP-OF-PAGE
         PERFORM LCOST-HEADER.
    MOVE SWUC (I) TO WUC-4DIGIT.
    IF   WUC-4DIGIT = PREV-4DIGIT-WUC
         ADD 1 TO I
         GO TO LCOST-PRINT.
    MOVE WUC-4DIGIT TO PREV-4DIGIT-WUC.
    ADD 1 TO K.
    MOVE SPACES TO DETAIL-LINE.
    MOVE PREV-4DIGIT-WUC TO D-DATA3.
    MOVE LCOST (K) TO D-DATA4.
    WRITE PRINT-RECORD FROM DETAIL-LINE
           AFTER POSITIONING 2 LINES.
    ADD 1 TO LINE-COUNT.
    ADD 1 TO I.
    IF   K = NFDWUC
         NEXT SENTENCE
    ELSE
         GO TO LCOST-PRINT.
START-PROCESS.
    MOVE SPACES TO DETAIL-LINE.
    MOVE ZERO TO J.
INCR-J.
    ADD 1 TO J.
    IF J IS GREATER THAN NSWUC PERFORM PRINT-TOTALS THRU
                                       PRINT-TOTALS-END
                  GO TO END-JOB.
    MOVE ZERO TO A1ACT (J), A2ACT (J), SACT (J), TACT (J),
                  A1MMH (J), A2MMH (J), SMMH (J), TMMH (J),
                  A1MU (J), A2MU (J), SMU (J), TMU (J),
                  A1S (J), A2S (J), SS (J), TS (J),
                  A1AWM (J), A2AWM (J), SAWM (J), TAWM (J).
    MOVE SWUC (J) TO GEN-JW-KEY-WUC.
    START JW-FILE KEY = GEN-JW-KEY INVALID KEY GO TO INCR-J.
READ-JW.
    READ JW-FILE AT END GO TO INCR-J.
    ADD 1 TO REC-CNT.
    IF REC-CNT = CTRR
         ADD 1000 TO CTRR
         DISPLAY 'PROCESSED RECORDS ' REC-CNT UPON CONSOLE.
    IF JW-WU-CODE NOT = SWUC (J) GO TO INCR-J.
    IF JW-ATC-LEVEL1 = 'A' GO TO SET-BUNOKEY.
    IF JW-ATC-LEVEL2 = 'A' GO TO SET-BUNOKEY.
    IF JW-ATC-LEVEL1 = 'S' GO TO SET-BUNOKEY.
    GO TO READ-JW.
SET-BUNOKEY.
    MOVE JW-BUREAU-NUMBER TO BUNOKEY.
    MOVE JW-JCN TO JCNKEY.
    IF JW-ATC-LEVEL1 = 'S' GO TO TEST-NPWUC.
    IF JW-ATC-LEVEL1 = 'A' ADD 1 TO A1ACT (J)
                             ADD JW-MMH-LEVEL1 TO A1MMH (J)
                             ADD JW-NORMU-TIME TO A1MU (J)
                             ADD JW-NORS-TIME TO A1S (J)
                             ADD JW-AWM-TIME TO A1AWM (J)
                             GO TO READ-JW.
    ADD JW-MMH-LEVEL1 TO A2MMH (J).
    ADD JW-MMH-LEVEL2 TO A2MMH (J).
    ADD 1 TO A2ACT (J).
    ADD JW-NORMU-TIME TO A2MU (J).
    ADD JW-NORS-TIME TO A2S (J).
    ADD JW-AWM-TIME TO A2AWM (J).
READ-JW-AGAIN.
    READ JW-FILE AT END GO TO RETURN-JW.
    IF JW-WU-CODE NOT = SWUC (J) GO TO RETURN-JW.
    MOVE JCNKEY-DATE TO SUB-1-DATE.
    MOVE JW-JCN-DATE TO SUB-2-DATE.
    SUBTRACT SUB-1-DATE FROM SUB-2-DATE GIVING DATE-DIFF.
    SUBTRACT JCNKEY-YR FROM JW-JCN-YR GIVING YR-DIFF.
    IF YR-DIFF IS NOT GREATER THAN ZERO GO TO TEST-DIFF.
    DIVIDE JCNKEY-YR BY 4 GIVING INTEGER-YR.
    MULTIPLY 4 BY INTEGER-YR.
    IF INTEGER-YR = JCNKEY-YR SUBTRACT 634 FROM DATE-DIFF
                                ELSE SUBTRACT 635 FROM DATE-DIFF.
```

```
       TEST-DIFF.
           IF DATE-DIFF IS GREATER THAN 1 GO TO RETURN-JW.
           IF JW-ATC-LEVEL1 NOT = 'T' GO TO READ-JW-AGAIN.
           IF JW-BUREAU-NUMBER = BUNOKEY GO TO READ-JW-AGAIN.
           PERFORM SEARCH-T-LIST THRU SEARCH-T-EXIT.
           IF T-SWITCH = ' ON' GO TO READ-JW-AGAIN.
           ADD 1 TO TACT (J).
           ADD JW-MMH-LEVEL1 TO TMMH (J).
           ADD JW-NORMU-TIME TO TMU (J).
           ADD JW-NORS-TIME TO TS (J).
           ADD JW-AWM-TIME TO TAWM (J).
           MOVE LOW-VALUE TO  T-NOM-KEY.
           MOVE JW-BUREAU-NUMBER TO  T-REC-BN.
           MOVE  JW-BUREAU-NUMBER TO BUFF-KEY.
           MOVE JW-JCN TO  T-REC-JCN.
           WRITE  T-LIST-REC INVALID KEY DISPLAY
                 'INVLAID WRITE FOR  T-LIST-FILE = '  T-NOM-KEY
                 UPON SYSLST.
           READ JW-FILE AT END GO TO RETURN-JW.
           IF JW-WU-CODE NOT = SWUC (J) GO TO RETURN-JW.
           IF  JW-BUREAU-NUMBER NOT = BUFF-KEY GO TO RETURN-JW.
           IF JW-ATC-LEVEL1 NOT = 'U' GO TO RETURN-JW.
           ADD JW-MMH-LEVEL1 TO TMAH (J).
       RETURN-JW.
           MOVE SWUC (J) TO JW-WU-CODE.  .
           MOVE JCNKEY TO JW-JCN.
           START JW-FILE KEY = JW-KEY INVALID KEY GO TO INCR-J.
           READ JW-FILE AT END GO TO INCR-J.
           GO TO READ-JW.
       TEST-NPWUC.
           IF NPWUC = ZERO GO TO READ-JW.
           MOVE JW-MMH-LEVEL1 TO BUFFR1.
           MOVE JW-NORMU-TIME TO BUFFR2.
           MOVE JW-NORS-TIME TO BUFFR3.
           MOVE JW-AWM-TIME TO BUFFR4.
           MOVE 'OFF' TO FOUND-SWT.
           MOVE BUNOKEY TO GEN-JB-KEY-BN.
           START JB-FILE KEY = GEN-JB-KEY INVALID KEY GO TO RETURN-JW.
       READ-JB-FILE.
           READ JB-FILE AT END GO TO JB-DECIDE.
           IF JB-BUREAU-NUMBER NOT = BUNOKEY GO TO JB-DECIDE.
           PERFORM SEARCH-PWUC-TABLE THRU SEARCH-PWUC-END.
           IF PWUC-SWT = 'N' GO TO READ-JB-FILE.
           IF JB-ATC-LEVEL2 NOT = 'A' GO TO READ-JB-FILE.
           IF JB-JCN NOT LESS THAN JCNKEY GO TO JB-DECIDE.
           IF JCNKEY-DATE GREATER THAN JB-ML1-DATE GO TO READ-JB-FILE.
           PERFORM SEARCH-2A-LIST THRU SEARCH-2A-END.
           IF 2A-SWT = 'Y' GO TO READ-JB-FILE.
           MOVE ' ON' TO FOUND-SWT.
           MOVE JB-BUREAU-NUMBER TO HOLD-BN.
           MOVE JB-JCN TO HOLD-JCN.
           GO TO READ-JB-FILE.
       JB-DECIDE.
           IF FOUND-SWT = 'OFF' GO TO RETURN-JW.
           ADD 1 TO SACT (J).
           ADD BUFFR1 TO SMMH (J).
           ADD BUFFR2 TO SMU (J).
           ADD BUFFR3 TO SS (J).
           ADD BUFFR4 TO SAWM (J).
           MOVE LOW-VALUE TO 2A-NOM-KEY.
           MOVE HOLD-TABLE TO 2A-REC-KEY.
           WRITE 2A-LIST-REC INVALID KEY DISPLAY
                 'INVLAID WRITE FOR 2A-LIST-FILE = ' 2A-NOM-KEY
                 UPON SYSLST.
       WRITE-OUT-S-FILE.
           MOVE HOLD-JCN TO S-KEY-JCN.
           MOVE HOLD-BN TO S-KEY-BUREAU-NUMBER.
           MOVE J TO S-INDEX.
           MOVE BUFFR1 TO S-MMH-VALUE.
           MOVE BUFFR2 TO S-MU-VALUE.
           MOVE BUFFR3 TO S-S-VALUE.
           MOVE BUFFR4 TO S-AWM-VALUE.
           WRITE S-RECORD INVALID KEY MOVE 08 TO ERR-IDX
                                      PERFORM ERR-RTN THRU ERR-RTN-EXIT.
           GO TO RETURN-JW.
       END-JOB.
           CLOSE JB-FILE
```

```
 11        PROG3A          18.35.11        01/19/79

                          JW-FILE
                          PRINT-FILE
                          S-FILE
                          MATRIX-FILE
                          INPUT-CARD-FILE1.
              STOP RUN.
***
***
         SEARCH-PWUC-TABLE.
             MOVE 'N' TO PWUC-SWT.
             IF JB-WU-CODE IS LESS THAN PWUC (1) GO TO SEARCH-PWUC-END.
             IF JB-WU-CODE IS GREATER THAN PWUC (NPWUC)
                                        GO TO SEARCH-PWUC-END.
             MOVE 1 TO INDX1.
             MOVE NPWUC TO INDX3.
         CONT-BINARY-SEARCH.
             SUBTRACT INDX1 FROM INDX3 GIVING BIN-DIFF.
             IF BIN-DIFF = 1 GO TO TEST-TWO-CODES.
             ADD INDX1 TO INDX3 GIVING INDX2.
             ADD 1 TO INDX2.
             DIVIDE 2 INTO INDX2.
             IF JB-WU-CODE IS LESS THAN PWUC (INDX2)
                                       MOVE INDX2 TO INDX3
                                       GO TO CONT-BINARY-SEARCH.
             MOVE INDX2 TO INDX1.
             GO TO CONT-BINARY-SEARCH.
         TEST-TWO-CODES.
             IF JB-WU-CODE = PWUC (INDX1) MOVE 'Y' TO PWUC-SWT
                                             MOVE INDX1 TO I.
             IF JB-WU-CODE = PWUC (INDX3) MOVE 'Y' TO PWUC-SWT
                                             MOVE INDX3 TO I.
             IF PWUC-SWT = 'N' GO TO SEARCH-PWUC-END.
             MOVE I TO MATRIX-NOM-KEY.
             READ MATRIX-FILE INVALID KEY MOVE 'N' TO PWUC-SWT
                                            GO TO SEARCH-PWUC-END.
             IF MATRIX-VAL (J) NOT = 1 MOVE 'N' TO PWUC-SWT.
         SEARCH-PWUC-END.
             EXIT.
***
         SEARCH-2A-LIST.
             MOVE 'Y' TO 2A-SWT.
             MOVE JB-BUREAU-NUMBER TO 2A-BUR-NO.
             MOVE JB-JCN TO 2A-JCN-DATA.
             READ 2A-LIST-FILE RECORD INVALID KEY
                         MOVE 'N' TO 2A-SWT.
         SEARCH-2A-END.
             EXIT.
***
         ERR-RTN.
             WRITE PRINT-RECORD FROM ERR-MSG (ERR-IDX) AFTER POSITIONING
                                                                 1 LINES.
             IF ERR-IDX = 9 WRITE PRINT-RECORD FROM 1 AFTER POSITIONING
                          \                            1 LINES!
         ERR-RTN-EXIT.
             EXIT.
***
         SEARCH-T-LIST.
             MOVE 'ON' TO T-SWITCH.
             MOVE JW-BUREAU-NUMBER TO  T-BUR-NO.
             MOVE JW-JCN TO  T-JCN.
             READ  T-LIST-FILE RECORD INVALID KEY
                         MOVE 'OFF' TO T-SWITCH.
         SEARCH-T-EXIT.
             EXIT.
***
         PRINT-TOTALS.
             PERFORM COST-RTN THRU COST-RTN-END.
             MOVE 1 TO OUT-COUNT.
             MOVE ZERO TO J.
             MOVE HEAD-TITLE (OUT-COUNT) TO OUT-HEADING.
             PERFORM ZERO-TOTAL-COSTS THRU ZERO-EXIT.
         HEADING-RTN.
             WRITE PRINT-RECORD FROM HEADING-1 AFTER POSITIONING 0 LINES.
             WRITE PRINT-RECORD FROM HEADING-2 AFTER POSITIONING 2 LINES.
             WRITE PRINT-RECORD FROM HEADING-3 AFTER POSITIONING 1 LINES.
             MOVE 5 TO LINE-COUNT.
         INCR-OUT-J1.
```

```
           ADD 1 TO J.
           IF J IS GREATER THAN NSWUC GO TO TOTAL-COST.
           MOVE SWUC (J) TO D-WUC.
           MOVE A1ACT (J) TO D-ACT.
           MOVE A1MMH (J) TO D-MMH.
           MULTIPLY 0.1 BY A1MU (J) ROUNDED.
           MOVE A1MU (J) TO D-MU.
           MULTIPLY 0.1 BY A1S (J) ROUNDED.
           MOVE A1S (J) TO D-S.
           MULTIPLY 0.1 BY A1AWM (J) ROUNDED.
           MOVE A1AWM (J) TO D-AWM.
           MOVE A1LCST (J) TO D-LABOR.
           IF LINE-COUNT IS GREATER THAN 60 PERFORM HEADING-RTN.
           WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                                     2 LINES.
           ADD 2 TO LINE-COUNT.
           ADD A1ACT (J) TO TOT-ACT.
           ADD A1MMH (J) TO TOT-MMH.
           ADD A1MU (J) TO TOT-MU.
           ADD A1S (J) TO TOT-S.
           ADD A1AWM (J) TO TOT-AWM.
           ADD A1LCST (J) TO TOT-LABOR.
           GO TO INCR-OUT-J1.
       TOTAL-COST.
           MOVE 'TOTAL' TO D-WUC.
           MOVE TOT-ACT TO D-ACT.
           MOVE TOT-MMH TO D-MMH.
           MOVE TOT-MU TO D-MU.
           MOVE TOT-S TO D-S.
           MOVE TOT-AWM TO D-AWM.
           MOVE TOT-LABOR TO D-LABOR.
           WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                                     2 LINES.
       END-TOTAL-COST.
           PERFORM ZERO-TOTAL-COSTS THRU ZERO-EXIT.
           ADD 1 TO OUT-COUNT.
           MOVE ZERO TO J.
           MOVE HEAD-TITLE (OUT-COUNT) TO OUT-HEADING.
           PERFORM HEADING-RTN.
       INCR-OUT-J2.
           ADD 1 TO J.
           IF J IS GREATER THAN NSWUC GO TO TOT-A2-COST.
           MOVE SWUC (J) TO D-WUC.
           MOVE A2ACT (J) TO D-ACT.
           MOVE A2MMH (J) TO D-MMH.
           MULTIPLY 0.1 BY A2MU (J) ROUNDED.
           MOVE A2MU (J) TO D-MU.
           MULTIPLY 0.1 BY A2S (J) ROUNDED.
           MOVE A2S (J) TO D-S.
           MULTIPLY 0.1 BY A2AWM (J) ROUNDED.
           MOVE A2AWM (J) TO D-AWM.
           MOVE A2LCST (J) TO D-LABOR.
           IF LINE-COUNT IS GREATER THAN 60 PERFORM HEADING-RTN.
           WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                                     2 LINES.
           ADD 2 TO LINE-COUNT.
           ADD A2ACT (J) TO TOT-ACT.
           ADD A2MMH (J) TO TOT-MMH.
           ADD A2MU (J) TO TOT-MU.
           ADD A2S (J) TO TOT-S.
           ADD A2AWM (J) TO TOT-AWM.
           ADD A2LCST (J) TO TOT-LABOR.
           GO TO INCR-OUT-J2.
       TOT-A2-COST.
           PERFORM TOTAL-COST.
           PERFORM ZERO-TOTAL-COSTS THRU ZERO-EXIT.
           ADD 1 TO OUT-COUNT.
           MOVE ZERO TO J.
           MOVE HEAD-TITLE (OUT-COUNT) TO OUT-HEADING.
           PERFORM HEADING-RTN.
       INCR-OUT-J3.
           ADD 1 TO J.
           IF J IS GREATER THAN NSWUC GO TO TOT-S-COST.
           MOVE SWUC (J) TO D-WUC.
           MOVE SACT (J) TO D-ACT.
           MOVE SMMH (J) TO D-MMH.
           MULTIPLY 0.1 BY SMU (J) ROUNDED.
```

```
            MOVE SMU (J) TO D-MU.
            MULTIPLY 0.1 BY SS (J) ROUNDED.
            MOVE SS (J) TO D-S.
            MULTIPLY 0.1 BY SAWM (J) ROUNDED.
            MOVE SAWM (J) TO D-AWM.
            MOVE SLCOST (J) TO D-LABOR.
            IF LINE-COUNT IS GREATER THAN 60 PERFORM HEADING-RTN.
            WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                                         2 LINES.
            ADD 2 TO LINE-COUNT.
            ADD SACT (J) TO TOT-ACT.
            ADD SMMH (J) TO TOT-MMH.
            ADD SMU (J) TO TOT-MU.
            ADD SS (J) TO TOT=S.
            ADD SAWM (J) TO TOT-AWM.
            ADD SLCOST (J) TO TOT-LABOR.
            GO TO INCR-OUT-J3.
        TOT-S-COST.
            PERFORM TOTAL-COST.
            PERFORM ZERO-TOTAL-COSTS THRU ZERO-EXIT.
            ADD 1 TO OUT-COUNT.
            MOVE ZERO TO J.
            MOVE HEAD-TITLE (OUT-COUNT) TO OUT-HEADING.
            PERFORM HEADING-RTN.
        INCR-OUT-J4.
            ADD 1 TO J.
            IF J IS GREATER THAN NSWUC GO TO TOT-T-COST.
            MOVE SWUC (J) TO D-WUC.
            MOVE TACT (J) TO D-ACT.
            MOVE TMMH (J) TO D-MMH.
            MULTIPLY 0.1 BY TMU (J) ROUNDED.
            MOVE TMU (J) TO D-MU.
            MULTIPLY 0.1 BY TS (J) ROUNDED.
            MOVE TS (J) TO D-S.
            MULTIPLY 0.1 BY TAWM (J) ROUNDED.
            MOVE TAWM (J) TO D-AWM.
            MOVE TLCOST (J) TO D-LABOR.
            IF LINE-COUNT IS GREATER THAN 60 PERFORM HEADING-RTN.
            WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                                         2 LINES.
            ADD 2 TO LINE-COUNT.
            ADD TACT (J) TO TOT-ACT.
            ADD TMMH (J) TO TOT-MMH.
            ADD TMU (J) TO TOT-MU.
            ADD TS (J) TO TOT-S.
            ADD TAWM (J) TO TOT=AWM.
            ADD TLCOST (J) TO TOT-LABOR.
            GO TO INCR-OUT-J4.
        TOT-T-COST.
            PERFORM TOTAL=COST.
        PRINT-TOTALS-END.
            EXIT.
 ***
        COST-RTN.
            MOVE SWUC (1) TO PREV-4DIGIT-WUC.
            MOVE ZERO TO J.
            MOVE 1 TO L.
        INCR-COST-J.
            ADD 1 TO J.
            IF J IS GREATER THAN NSWUC GO TO COST-RTN-END.
            MOVE SWUC (J) TO WUC-4DIGIT.
            IF WUC-4DIGIT = PREV-4DIGIT-WUC NEXT SENTENCE
                            ELSE ADD 1 TO L
                                 MOVE WUC-4DIGIT TO PREV-4DIGIT-WUC.
            MULTIPLY 0.1 BY A1MMH (J) ROUNDED.
            MULTIPLY 0.1 BY A2MMH (J) ROUNDED.
            MULTIPLY 0.1 BY SMMH (J) ROUNDED.
            MULTIPLY 0.1 BY TMMH (J) ROUNDED.
            MULTIPLY A1MMH (J) BY LCOST (L) GIVING A1LCST (J).
            MULTIPLY A2MMH (J) BY LCOST (L) GIVING A2LCST (J).
            MULTIPLY SMMH (J) BY LCOST (L) GIVING SLCOST (J).
            MULTIPLY TMMH (J) BY LCOST (L) GIVING TLCOST (J).
            GO TO INCR-COST-J.
        COST-RTN-END.
            EXIT.
        ZERO-TOTAL-COSTS.
            MOVE ZERO TO TOT-ACT, TOT-MMH, TOT-MU,
01001                              TOT-S, TOT-AWM, TOT-LABOR.
01002          ZERO-EXIT.
01003              EXIT.
```

```
1   IBM DOS VS COBOL                              REL 2.4 + PTF27  PP NO. 5746-CB1                         16.27.53  09/25/78

  CBL SXREF,STATE,QUOTE,CLIST,FLOW
               IDENTIFICATION DIVISION.
               PROGRAM-ID. PROG3A1.
               AUTHOR.  TONY GIRGENTI , ISI.
               ENVIRONMENT DIVISION.
               CONFIGURATION SECTION.
               SOURCE-COMPUTER. IBM-370.
               OBJECT-COMPUTER. IBM-370.
               INPUT-OUTPUT SECTION.
               FILE-CONTROL.
                   SELECT  SFILIN ASSIGN TO SYS030-DA-3340-S
                           ACCESS MODE IS SEQUENTIAL.
                   SELECT  INDXS ASSIGN TO SYS031-DA-3340-I
                           ACCESS MODE IS SEQUENTIAL
                           RECORD KEY IS IS-KEY.
               DATA DIVISION.
               FILE SECTION.
               FD  SFILIN
                   LABEL RECORD IS STANDARD
                           RECORDING MODE IS F
                           BLOCK CONTAINS 60 RECORDS
                   RECORD CONTAINS 42  CHARACTERS.
               01  S-RECORD.
                   05  FILLER                     PIC X(42).
               FD  INDXS   LABEL RECORD IS STANDARD
                           RECORDING MODE IS F
                           BLOCK CONTAINS 60 RECORDS
                           RECORD CONTAINS 42  CHARACTERS.
               01  IS-RECORD.
                   05  IS-KEY                     PIC X(16).
                   05  FILLER                     PIC X(26).
               WORKING-STORAGE SECTION.
               PROCEDURE DIVISION.
                           OPEN INPUT SFILIN.
                           OPEN OUTPUT INDXS.
               START-RUN.
                   READ SFILIN INTO IS-RECORD
                               AT END GO TO END-OF-RUN.
                   WRITE  IS-RECORD INVALID KEY DISPLAY  INVALID KEY S-FILE =
                                                  IS-KEY UPON CONSOLE.
                           GO TO START-RUN.
               END-OF-RUN.
                           CLOSE SFILIN.
                           CLOSE INDXS.
                   STOP RUN.
```

```
CBL SXREF,CLIST,FLOW,STATE
       IDENTIFICATION DIVISION.
       PROGRAM-ID. PROG38.
       AUTHOR. INFORMATION SPECTRUM.
       ENVIRONMENT DIVISION.
       CONFIGURATION SECTION.
       SOURCE-COMPUTER. IBM-370.
       OBJECT-COMPUTER. IBM-370.
       INPUT-OUTPUT SECTION.
       FILE-CONTROL.
           SELECT JBW-FILE ASSIGN TO SYS030-DA-3340-I
                  ACCESS MODE IS SEQUENTIAL
                  NOMINAL KEY IS JBW-NOMINAL-KEY
                  RECORD KEY IS JBW-KEY
                  RESERVE NO ALTERNATE AREAS.
           SELECT JSW-FILE ASSIGN TO SYS031-DA-3340-I
                  ACCESS MODE IS SEQUENTIAL
                  NOMINAL KEY IS JSW-NOMINAL-KEY
                  RECORD KEY IS JSW-KEY
                  RESERVE NO ALTERNATE AREAS.
           SELECT JW-FILE ASSIGN TO SYS032-DA-3340-I
                  ACCESS MODE IS SEQUENTIAL
                  NOMINAL KEY IS JW-NOMINAL-KEY
                  RECORD KEY IS JW-KEY
                  RESERVE NO ALTERNATE AREAS.
           SELECT S-FILE ASSIGN TO SYS034-DA-3340-I
                   ACCESS MODE IS RANDOM
                   NOMINAL KEY IS S-NOMINAL-KEY
                  RECORD KEY IS S-KEY
                  RESERVE NO ALTERNATE AREAS.
           SELECT MATRIX-FILE ASSIGN TO SYS029-DA-3340-I
                  ACCESS MODE IS RANDOM
                  NOMINAL KEY IS MATRIX-NOMINAL-KEY
                  RECORD KEY IS MATRIX-KEY
                  RESERVE NO ALTERNATE AREAS.
           SELECT 2BC-LIST-FILE ASSIGN TO SYS033-DA-3340-I
                  ACCESS MODE IS RANDOM
                  NOMINAL KEY IS 2BC-NOM-KEY
                   RECORD KEY IS 2BC-REC-KEY
                  RESERVE NO ALTERNATE AREAS.
           SELECT 2A-LIST-FILE ASSIGN TO SYS028-DA-3340-I
                  ACCESS MODE IS RANDOM
                  NOMINAL KEY IS 2A-NOM-KEY
                  RECORD KEY IS 2A-REC-KEY
                  RESERVE NO ALTERNATE AREAS.
           SELECT PRINT-FILE ASSIGN TO SYS008-UR-3203-S.
           SELECT INPUT-CARD-FILE1 ASSIGN TO SYS007-UR-1442R-S.
           SELECT RESTART-FILE ASSIGN TO SYS027-DA-3340-S.
       DATA DIVISION.
       FILE SECTION.
       FD  INPUT-CARD-FILE1 LABEL RECORDS ARE OMITTED.
       01  INPUT-FILE-1-REC.
           02 FILLER                        PIC X(80).
       FD  JBW-FILE LABEL RECORDS ARE STANDARD
           BLOCK CONTAINS 10 RECORDS.
       01  JBW-RECORD.
           02 JBW-KEY.
              03 JBW-BN-WU.
                 04 JBW-WU-CODE         PIC X(5).
                 04 JBW-BUREAU-NUMBER      PIC 9(6).
              03 JBW-JCN.
                 04 JBW-JCN-DATE           PIC 9(5).
                 04 JBW-JCN-SEQUENCE       PIC 9(3).
                 04 JBW-JCN-SUFFIX         PIC X(2).
           02 REST-OF-JBW.
              03 FILLER                 PIC X.
              03 JBW-IF-CODE               PIC X(4).
              03 FILLER                    PIC X.
              03 JBW-SERIAL-NUMBER         PIC X(10).
              03 FILLER                    PIC X.
           02 JBW-GENERIC.
              03 JBW-ORG-CODE              PIC X(3).
              03 FILLER                    PIC X.
              03 JBW-ML1-DATE           PIC 9(5).
              03 FILLER                    PIC X.
              03 JBW-ML2-DATE           PIC 9(5).
              03 FILLER                    PIC X.
```

```
                 03 JBW-ATC-LEVEL1           PIC X.
                 03 FILLER                   PIC X.
                 03 JBW-ATC-LEVEL2           PIC X.
                 03 FILLER                   PIC X.
                 03 JBW-HMC-LEVEL1           PIC X(3).
                 03 FILLER                   PIC X.
                 03 JBW-HMC-LEVEL2           PIC X(3).
                 03 FILLER                   PIC X.
                 03 JBW-METER-TIME           PIC 9(4).
                 03 FILLER                   PIC X.
                 03 JBW-EMT-LEVEL1           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JBW-EMT-LEVEL2           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JBW-MMH-LEVEL1           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JBW-MMH-LEVEL2           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JBW-NORMU-TIME           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JBW-NORS-TIME            PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JBW-AWM-TIME             PIC 9(4).
         FD  JSW-FILE LABEL RECORDS ARE STANDARD
             BLOCK CONTAINS 60 RECORDS.
         01  JSW-RECORD.
             02 JSW-KEY.
                 03 JSW-SN-WU.
                     04 JSW-WU-CODE      PIC X(5).
                     04 JSW-SERIAL-NUMBER    PIC X(10).
                 03 JSW-JCN.
                     04 JSW-JCN-DATE         PIC 9(5).
                     04 JSW-JCN-SEQUENCE     PIC 9(3).
                     04 JSW-JCN-SUFFIX       PIC X(2).
             02 REST-OF-JSW.
                 03 FILLER               PIC X.
                 03 JSW-TF-CODE              PIC X(4).
                 03 FILLER                   PIC X.
                 03 JSW-BUREAU-NUMBER        PIC 9(6).
                 03 FILLER                   PIC X.
             02 JSW-GENERIC.
                 03 JSW-ORG-CODE             PIC X(3).
                 03 FILLER                   PIC X.
                 03 JSW-ML1-DATE         PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JSW-ML2-DATE         PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JSW-ATC-LEVEL1           PIC X.
                 03 FILLER                   PIC X.
                 03 JSW-ATC-LEVEL2           PIC X.
                 03 FILLER                   PIC X.
                 03 JSW-HMC-LEVEL1           PIC X(3).
                 03 FILLER                   PIC X.
                 03 JSW-HMC-LEVEL2           PIC X(3).
                 03 FILLER                   PIC X.
                 03 JSW-METER-TIME           PIC 9(4).
                 03 FILLER                   PIC X.
                 03 JSW-EMT-LEVEL1           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JSW-EMT-LEVEL2           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JSW-MMH-LEVEL1           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JSW-MMH-LEVEL2           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JSW-NOPMU-TIME           PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JSW-NORS-TIME            PIC 9(5).
                 03 FILLER                   PIC X.
                 03 JSW-AWM-TIME             PIC 9(4).
         FD  JW-FILE LABEL RECORDS ARE STANDARD
             BLOCK CONTAINS 60 RECORDS.
         01  JW-RECORD.
             02 JW-KEY.
                 03 JW-WU-CODE           PIC X(5).
                 03 JW-JCN.
                     04 JW-JCN-DATE          PIC 9(5).
```

```
                            04 JW-JCN-SEQUENCE        PIC 9(3).
                            04 JW-JCN-SUFFIX          PIC X(2).
                    02 REST-OF-JW.
                        03 FILLER                 PIC X.
                        03 JW-TE-CODE                 PIC X(4).
                        03 FILLER                     PIC X.
                        03 JW-BUREAU-NUMBER           PIC 9(6).
                        03 FILLER                     PIC X.
                        03 JW-SERIAL-NUMBER           PIC X(10).
                        03 FILLER                     PIC X.
                    02 JW-GENERIC.
                        03 JW-ORG-CODE                PIC X(3).
                        03 FILLER                     PIC X.
                        03 JW-ML1-DATE            PIC 9(5).
                        03 FILLER                     PIC X.
                        03 JW-ML2-DATE            PIC 9(5).
                        03 FILLER                     PIC X.
                        03 JW-ATC-LEVEL1              PIC X.
                        03 FILLER                     PIC X.
                        03 JW-ATC-LEVEL2              PIC X.
                        03 FILLER                     PIC X.
                        03 JW-HMC-LEVEL2              PIC 9(3).
                        03 FILLER                     PIC X.
                        03 JW-HMC-LEVEL2              PIC 9(3).
                        03 FILLER                     PIC X.
                        03 JW-METER-TIME              PIC 9(4).
                        03 FILLER                     PIC X.
                        03 JW-FMT-LEVEL1              PIC 9(5).
                        03 FILLER                     PIC X.
                        03 JW-EMT-LEVEL2              PIC 9(5).
                        03 FILLER                     PIC X.
                        03 JW-MMH-LEVEL1              PIC 9(5).
                        03 FILLER                     PIC X.
                        03 JW-MMH-LEVEL2              PIC 9(5).
                        03 FILLER                     PIC X.
                        03 JW-NORMU-TIME              PIC 9(5).
                        03 FILLER                     PIC X.
                        03 JW-NORS-TIME               PIC 9(5).
                        03 FILLER                     PIC X.
                        03 JW-AWM-TIME                PIC 9(4).
               FD   S-FILE LABEL RECORDS ARE STANDARD
                    BLOCK CONTAINS 50 RECORDS
                            RECORD CONTAINS 42  CHARACTERS.
               01   S-RECORD.
          03        02 S-KEY.
          04            03 S-KEY-BUREAU-NUMBER  PIC 9(6).
          05            03 S-KEY-JCN.
          06                04 S-KEY-JCN-DATE         PIC 9(5).
          07                04 S-KEY-JCN-SEQUENCE     PIC 9(3).
                            04 S-KEY-JCN-SUFFIX        PIC X(2).
                    02 S-INDEX                        PIC 9(3).
          15        02 S-MMH-VALUE                    PIC 9(6).
          16        02 S-MU-VALUE                     PIC 9(6).
          17        02 S-S-VALUE                      PIC 9(6).
          18        02 S-AWA-VALUE                    PIC 9(5).
               FD   MATRIX-FILE LABEL RECORDS ARE STANDARD.
               01   MATRIX-FILE-REC.
                    02 MATRIX-KEY                     PIC 9(3).
                    02 MATRIX-TAB OCCURS 300 TIMES.
                        03 MATRIX-VAL                 PIC X.
               FD   2BC-LIST-FILE LABEL RECORDS ARE STANDARD
                                  RECORDING MODE IS F
                                  BLOCK CONTAINS 500 RECORDS
                                  RECORD CONTAINS 16 CHARACTERS.
               01   2BC-RECORD.
                    02 2BC-REC-KEY.
                        03 BUREAU-NUMBER-2BC      PIC 9(6).
                        03 JCN-2BC.
                            04 JCN-DATE-2BC       PIC 9(5).
                            04 JCN-DATE-2BC       PIC 9(3).
                            04 JCN-SUFFIX-2BC     PIC X(2).
               FD   2A-LIST-FILE LABEL RECORDS ARE STANDARD
                                 RECORDING MODE IS F
                                 BLOCK CONTAINS 500 RECORDS
                                 RECORD CONTAINS 16 CHARACTERS.
               01   2A-RECORD.
                    02 2A-REC-KEY.
```

```
                        03 BUREAU-NUMBEP-2A       PIC 9(6).
                        03 JCN-2A.
                           04 JCN-DATE-2A         PIC 9(5).
                           04 JCN-SEQUENCE-2A     PIC 9(3).
                           04 JCN-SUFFIX-2A       PIC X(2).
             FD   PRINT-FILE LABEL RECORDS ARE OMITTED.
             01   PRINT-RECORD.
                  02 PRINT-LINE                   PIC X(132).
             FD   RESTART-FILE LABEL RECORDS ARE STANDARD.
             01   RESTART-RECORD.
                  02 A1-RESTART.
                     03 A1-RESTART-ACT            PIC 9(4).
                     03 A1-RESTART-MMH            PIC 9(7)V9.
                     03 A1-RESTART-MU             PIC 9(7)V9.
                     03 A1-RESTART-S              PIC 9(7)V9.
                     03 A1-RESTART-AWM            PIC 9(7)V9.
                  02 A2-RESTART.
                     03 A2-RESTART-ACT            PIC 9(4).
                     03 A2-RESTART-MMH            PIC 9(7)V9.
                     03 A2-RESTART-MU             PIC 9(7)V9.
                     03 A2-RESTART-S              PIC 9(7)V9.
                     03 A2-RESTART-AWM            PIC 9(7)V9.
                  02 C-RESTART.
                     03 C-RESTART-ACT             PIC 9(4).
                     03 C-RESTART-MMH             PIC 9(7)V9.
                     03 C-RESTART-MU              PIC 9(7)V9.
                     03 C-RESTART-S               PIC 9(7)V9.
                     03 C-RESTART-AWM             PIC 9(7)V9.
                  02 D-RESTART.
                     03 D-RESTART-ACT             PIC 9(4).
                     03 D-RESTART-MMH             PIC 9(7)V9.
                     03 D-RESTART-MU              PIC 9(7)V9.
                     03 D-RESTART-S               PIC 9(7)V9.
                     03 D-RESTART-AWM             PIC 9(7)V9.
                  02 S-RESTART.
                     03 S-RESTART-ACT             PIC 9(4).
                     03 S-RESTART-MMH             PIC 9(7)V9.
                     03 S-RESTART-MU              PIC 9(7)V9.
                     03 S-RESTART-S               PIC 9(7)V9.
                     03 S-RESTART-AWM             PIC 9(7)V9.
                  02 DEP-RESTART                  PIC 9(5).
                  02 ATT-RESTART                  PIC 9(5).
**     01   WORKING-STORAGE SECTION.
             77   HDR1     PIC X(29) VALUE 'D I S P L A Y  O F  I N P U T'.
             77   PIC-NAME                        PIC X(10) VALUE 'PROGRAM-38'.
       02    77   J                               PIC 9(3).
       03    77   I                               PIC 9(3).
       04    77   K                               PIC 9(3).
       05    77   L                               PIC 9(3).
       06    77   ERR-IDX                         PIC 9(2).
       07    77   NSWUC                           PIC 9(3).
       08    77   NFWUC                           PIC 9(3).
       09    77   NFDWUC                          PIC 9(3).
       11    77   BUNOKEY                         PIC 9(6).
       12    77   SWT-2BC                         PIC X.
       13    77   COUNT                           PIC 9(3).
             77   ML1DAT                          PIC 9(5).
             77   DATE-DIFF                       PIC S9(5) TRAILING.
       17    77   SWITCH                          PIC 9.
       18    77   SWITCH2                         PIC 9.
             77   ML2DAT                          PIC 9(5).
             77   SERKEY                          PIC X(10).
             77   MTIME                           PIC 9(4).
             77   TIME-DIFF                       PIC S9(4)   TRAILING.
**     01    77   IJ                              PIC 9(3).
       02    77   ICOUNT                          PIC 9(3).
       03    77   SAVE-COUN2                      PIC 9(3).
       04    77   COUN2                           PIC 9(3).
       09    77   REM-COUN2                       PIC 9(3).
             77   MIN-POS-VALUE                   PIC 9(5).
       11    77   I2                              PIC 9(3).
       12    77   PCOUNT                          PIC 9(3).
       13    77   COUNT                           PIC 9(3).
       14    77   L-IDX                           PIC 9(3).
       15    77   LI                              PIC 9(3).
             77   SWUC-DIGIT4                     PIC X(4).
             77   PREV-SWUC-DIGIT4                PIC X(4).
```

```
        77  REM-COUNT                      PIC 9(3).
        77  CARD-COUNT                     PIC 9(2).
        77  MATRIX-IDX                     PIC 9(3).
        77  JCNO-IDX                       PIC 9(3).
        77  S-SWT                          PIC X.
        77  INDX1                          PIC 9(3).
        77  INDX2                          PIC 9(3).
        77  INDX3                          PIC 9(3).
        77  BIN-DIFF                       PIC S9(3) TRAILING.
        77  2A-SWT                         PIC X.
        77  FIRST1                         PIC 9(3).
        77  INTEGER-YR                     PIC  9(2).
        77  YR-DIFF                        PIC  S9(2) TRAILING.
        77  CTRR                PIC 9(6)  VALUE 1000.
        77  REC-CNT             PIC 9(6)  VALUE ZEROS.
        77  SWT-COUNT                      PIC 999.
        77  K2                             PIC 999.
        77  SAVE-J                         PIC 9(3).
        77  RESTART-ANS   PIC X.
        77  CHECK-PT-REC-COUNT  PIC 9(5)  VALUE ZERO.
        77  NEXT-CHECK-POINT  PIC 9(5)  VALUE ZERO.
        01  BUFFER-DATES.
            02 SUB-BUFFER-DATE1            PIC 9(5).
            02 BUFFER-DATE1 REDEFINES SUB-BUFFER-DATE1.
                03 BUFFER-DATE1-YR         PIC 9(2).
                03 BUFFER-DATE1-DAY        PIC 9(3).
            02 SUB-BUFFER-DATE2            PIC 9(5).
            02 BUFFER-DATE2 REDEFINES SUB-BUFFER-DATE2.
                03 BUFFER-DATE2-YR         PIC 9(2).
                03 BUFFER-DATE2-DAY        PIC 9(3).
        01  PRINT-COUNT-LINE.
            02 FILLER                      PIC X VALUE SPACE.
            02 OUT-COUNT                                PIC 9(3).

        01  GENERIC-DATA.
            02 GEN-WUC                     PIC X(5).
            02 GEN-BUREAU-NUMBER           PIC 9(6).
            02 GEN-JCN.
                03 GEN-JCN-DATE            PIC 9(5).
                03 GEN-JCN-SEQUENCE        PIC 9(3).
                03 GEN-JCN-SUFFIX          PIC X(2).
            02 GEN-TE-CODE                 PIC X(4).
            02 GEN-SERIAL-NUMBER           PIC X(10).
            02 REST-OF-GENERIC.
                03 GEN-ORG-CODE            PIC X(3).
                03 FILLER                  PIC X.
                03 GEN-ML1-DATE            PIC 9(5).
                03 FILLER                  PIC X.
                03 GEN-ML2-DATE            PIC 9(5).
                03 FILLER                  PIC X.
                03 GEN-ATC-LEVEL1          PIC X.
                03 FILLER                  PIC X.
                03 GEN-ATC-LEVEL2          PIC X.
                03 FILLER                  PIC X.
                03 GEN-UMC-LEVEL1          PIC X(3).
                03 FILLER                  PIC X.
                03 GEN-UMC-LEVEL2          PIC X(3).
                03 FILLER                  PIC X.
                03 GEN-METER-TIME          PIC 9(4).
                03 FILLER                  PIC X.
                03 GEN-EMT-LEVEL1          PIC 9(5).
                03 FILLER                  PIC X.
                03 GEN-EMT-LEVEL2          PIC 9(5).
                03 FILLER                  PIC X.
                03 GEN-MMH-LEVEL1          PIC 9(5).
                03 FILLER                  PIC X.
                03 GEN-MMH-LEVEL2          PIC 9(5).
                03 FILLER                  PIC X.
                03 GEN-NORMU-TIME          PIC 9(5).
                03 FILLER                  PIC X.
                03 GEN-NORS-TIME           PIC 9(5).
                03 FILLER                  PIC X.
                03 GEN-AWM-TIME            PIC 9(4).
  ***
        01  INPUT-CARD-REC1.
            02 INPUT-VALUE1             PIC 9(3).
            02 INPUT-VALUE1E    REDEFINES INPUT-VALUE1    PIC X(3).
```

```
           01  INPUT-CARD-REC2.
               02 INPUT-REC2   OCCURS 11 TIMES.
                   03 INPUT=VALUE2              PIC X(5).
                   03 FILLER                    PIC X(2).
           01  INPUT-CARD-REC3.
               02 FILLER                        PIC X(2).
               02 INPUT-L                   PIC 9(6)V99.
               02 INPUT-LE    REDEFINES INPUT-L    PIC X(8).
               02 FILLER                        PIC X(2).
               02 INPUT-M                   PIC 9(6)V99.
               02 INPUT-ME    REDEFINES INPUT-M    PIC X(8).
               02 FILLER                        PIC X(2).
               02 INPUT-DL                  PIC 9(6)V99.
               02 INPUT-DLE    REDEFINES INPUT-DL    PIC X(8).
               02 FILLER                        PIC X(2).
               02 INPUT-DM                  PIC 9(6)V99.
               02 INPUT-DME    REDEFINES INPUT-DM    PIC X(8).
               02 FILLER                        PIC X(2).
               02 INPUT-DT                  PIC 9(6)V99.
               02 INPUT-DTE    REDEFINES INPUT-DT    PIC X(8).
               02 FILLER                        PIC X(2).
               02 INPUT-AT                  PIC 9(6)V99.
               02 INPUT-ATE    REDEFINES INPUT-AT    PIC X(8).
           01  TEST-TABLE.
               02 TEST-VALUE                    PIC 9(3).
               02 TEST-VAL    REDEFINES TEST-VALUE    PIC X(3).
      ***
           01  JBW-NOMINAL-KEY.
               02 JBW-NOM-WUC                   PIC X(5).
               02 JBW-NOM-BN                    PIC 9(6).
               02 JBW-NOM-JCN-NUM               PIC 9(8).
               02 JBW-NOM-SUFFIX                PIC X(2).
      ***
           01  JW-NOMINAL-KEY.
               02 JW-NOM-WUC                    PIC X(5).
               02 JW-NOM-JCN-NUM                PIC 9(8).
               02 JW-NOM-JCN-SUFFIX             PIC X(2).
      ***
           01  JSW-NOMINAL-KEY.
               02 JSW-NOM-WUC                   PIC X(5).
               02 JSW-NOM-SN                    PIC X(10).
               02 JSW-NOM-JCN-NUM               PIC 9(8).
               02 JSW-NOM-JCN-SUFFIX            PIC X(2).
      ***
           01  MATRIX-NOMINAL-KEY.
               02 MATRIX-NOM-KEY                PIC 9(3).
      ***
           01  S-NOMINAL-KEY.
               02 S-NOM-BN                      PIC 9(6).
               02 S-NOM-JCN.
                   03 S-NOM-JCN-DATE            PIC 9(5).
                   03 S-NOM-JCN-SEQUENCE        PIC 9(3).
                   03 S-NOM-JCN-SUFFIX          PIC X(2).
           01  2BC-NOM-KEY.
               02 2BC-NOM-BN                    PIC 9(6).
               02 2BC-NOM-JCN.
                   03 2BC-NOM-JCN-DATE          PIC 9(5).
                   03 2BC-NOM-JCN-SEQUENCE      PIC 9(3).
                   03 2BC-NOM-JCN-SUFFIX        PIC X(2).
      ***
           01  2A-NOM-KEY.
               02 2A-NOM-BN                     PIC 9(6).
               02 2A-NOM-JCN.
                   03 2A-NOM-JCN-DATE           PIC 9(5).
                   03 2A-NOM-JCN-SEQUENCE       PIC 9(3).
                   03 2A-NOM-JCN-SUFFIX         PIC X(2).
      ***
           01  GEN-JBW-KEY2.
               02 GEN-JBW-KEY2-WUC              PIC X(5).
               02 GEN-JBW-KEY2-BN               PIC 9(6).
      ***
           01  GEN-JBW-KEY1.
               02 GEN-JBW-KEY1-WUC              PIC X(5).
      ***
           01  GEN-JSW-KEY.
               02 GEN-JSW-KEY-WUC               PIC X(5).
      ***
```

```
00462                 01  RESULT-COST-TABLE.
00463                     02 R-COST-TABLE OCCURS 300 TIMES COMP-3.
00464                         03 A1LCST                   PIC 9(8)V99.
00465                         03 A2LCST                   PIC 9(8)V99.
00466                         03 SLCOST                   PIC 9(8)V99.
00467                         03 CLCOST                   PIC 9(8)V99.
00468                         03 CMCOST                   PIC 9(8)V99.
00469                         03 DLCST                    PIC 9(8)V99.
00470                         03 DMCST                    PIC 9(8)V99.
00471                         03 DEPLCST                  PIC 9(8)V99.
00472                         03 DEPMCST                  PIC 9(8)V99.
00473                         03 DEPTCST                  PIC 9(8)V99.
00474                         03 ATRCST                   PIC 9(8)V99.
00475 ***
00476                 01  PHYS-DAMAGE-TABLE.
00477                     02 PHY-DAMAGE-CODES.
00478                         03 FILLER                   PIC X(3) VALUE '070'.
00479                         03 FILLER                   PIC X(3) VALUE '092'.
00480                         03 FILLER                   PIC X(3) VALUE '093'.
00481                         03 FILLER                   PIC X(3) VALUE '105'.
00482                         03 FILLER                   PIC X(3) VALUE '106'.
00483                         03 FILLER                   PIC X(3) VALUE '108'.
00484                         03 FILLER                   PIC X(3) VALUE '127'.
00485                         03 FILLER                   PIC X(3) VALUE '135'.
00486                         03 FILLER                   PIC X(3) VALUE '160'.
00487                         03 FILLER                   PIC X(3) VALUE '410'.
00488                         03 FILLER                   PIC X(3) VALUE '425'.
00489                         03 FILLER                   PIC X(3) VALUE '585'.
00490                         03 FILLER                   PIC X(3) VALUE '651'.
00491                         03 FILLER                   PIC X(3) VALUE '730'.
00492                         03 FILLER                   PIC X(3) VALUE '780'.
00493                         03 FILLER                   PIC X(3) VALUE '935'.
00494    *    18
00495 **      20          02 HMC-TAB    REDEFINES PHY-DAMAGE-CODES   OCCURS 16 TIMES.
00496                         03 HMC                      PIC X(3).
00497    *
00498                 01  NHMC                            PIC 9(3) VALUE 16.
00499 ***
00500 **E     01      01  SWUC-TABLE.
00501                     02 SWUC-TAB OCCURS 300 TIMES.
00502 **      03              03 SWUC                     PIC X(5).
00503    *    04
00504 **      05      01  FWUC-TABLE.
00505                     02 FWUC-TAB OCCURS 300 TIMES.
00506         07              03 FWUC                     PIC X(5).
00507    *    08
00508 **      09      01  MAINT-COST-TABLE.
00509                     02 MAINT-COST-TAB OCCURS 50 TIMES COMP-3.
00510         11              03 LCOST                    PIC 9(6)V99.
00511         12              03 MCOST                    PIC 9(6)V99.
00512         13              03 DLCOST                   PIC 9(6)V99.
00513         14              03 DMCOST                   PIC 9(6)V99.
00514         15              03 DTCOST                   PIC 9(6)V99.
00515         16              03 ATCOST                   PIC 9(6)V99.
00516    *    17
00517 **      01      01  AI-COST-TABLE.
00518                     02 AI-COST-TAB OCCURS 300 TIMES COMP-3.
00519                         03 AIACT                    PIC 9(4).
00520                         03 AIMMH                    PIC 9(7)V9.
00521                         03 AIMU                     PIC 9(7)V9.
00522                         03 AIS                      PIC 9(7)V9.
00523                         03 AIAWM                    PIC 9(7)V9.
00524    *    08
00525 **      09      01  C-COST-TABLE.
00526                     02 C-COST-TAB OCCURS 300 TIMES COMP-3.
00527                         03 CACT                     PIC 9(4).
00528                         03 CMMH                     PIC 9(7)V9.
00529                         03 CMU                      PIC 9(7)V9.
00530                         03 CS                       PIC 9(7)V9.
00531                         03 CAWM                     PIC 9(7)V9.
00532    *    16
00533 **      17      01  D-COST-TABLE.
00534                     02 D-COST-TAB OCCURS 300 TIMES COMP-3.
00535                         03 DACT                     PIC 9(4).
00536                         03 DMMH                     PIC 9(7)V9.
00537                         03 DMU                      PIC 9(7)V9.
00538                         03 DS                       PIC 9(7)V9.
```

```
                           03 DAWM                       PIC 9(7)V9.
          *
          **   01   01   A2-COST-TABLE.
                         02 A2-COST-TAB OCCURS 300 TIMES COMP-3.
                               03 A2ACT                  PIC 9(4).
                               03 A2MMU                  PIC 9(7)V9.
                               03 A2MU                   PIC 9(7)V9.
                               03 A2S                    PIC 9(7)V9.
                               03 A2AWM                  PIC 9(7)V9.
          *    08
          **   09   01   S-COST-TABLE.
                         02 S-COST-TAB OCCURS 300 TIMES COMP-3.
                               03 SACT                   PIC 9(4).
                               03 SMMU                   PIC 9(7)V9.
                               03 SMU                    PIC 9(7)V9.
                               03 SS                     PIC 9(7)V9.
                               03 SAWM                   PIC 9(7)V9.
          *
          **   01   01   TEST-2BC-JCN.
               02        02 TEST-2BC-JCN-DATE            PIC 9(5).
               03        02 TEST-2BC-JCN-SEQUENCE        PIC 9(3).
               04        02 TEST-2BC-JCN-SUFFIX          PIC X(2).
          *
          **   06   01   TEST-2BC-BN                     PIC 9(6).
          *    07
          **   08   01   JCNKEY.
               09        02 JCNKEY-DATE                  PIC 9(5).
               10        02 JCNKEY-SEQUFNCE              PIC 9(3).
               11        02 JCNKEY-SUFFIX                PIC X(2).
          *    12
          **   13   01   BUFFER.
               14        02 BUFMMU                       PIC 9(8) VALUE ZERO.
               15        02 BUFMU                        PIC 9(8) VALUE ZERO.
               16        02 BUFS                         PIC 9(8) VALUE ZERO.
               17        02 BUFAWM                       PIC 9(7) VALUE ZERO.
          *    18
          **   19   01   BUFFER2.
               20        02 BUFMMU2                      PIC 9(8) VALUE ZERO.
                         02 BUFMU2                       PIC 9(8) VALUE ZERO.
                         02 BUFS2                        PIC 9(8) VALUE ZERO.
                         02 BUFAWM2                      PIC 9(7) VALUE ZERO.
          *
          **   01   01   ABUFFER-TABLE.
                         02 ABUFFER-TAB OCCURS 200 TIMES.
               03              03 ABUFMU                 PIC 9(8).
               04              03 ABUFMU                 PIC 9(8).
               05              03 ABUFS                  PIC 9(8).
               06              03 ABUFAWM                PIC 9(7).
                               03 JABUFR                 PIC 9(3).
                               03 IABUFR                 PIC 9(3).
          *    08
          **   09   01   SBUFFER-TABLE.
                         02 SBUFFER-TAB OCCURS 200 TIMES.
                               03 SBUFMU                 PIC 9(8).
                               03 SBUFMU                 PIC 9(8).
                               03 SBUFS                  PIC 9(8).
                               03 SBUFAWM                PIC 9(7).
                               03 JSBUFR                 PIC 9(3).
          *
          ***
          **   09   01   JCNKEY2.
               10        02 JCNKEY2-DATE                 PIC 9(5).
               11        02 JCNKEY2-SEQUENCE             PIC 9(3).
               12        02 JCNKEY2-SUFFIX               PIC X(2).
          *
          **   14   01   DEPOT-TABLE.
                         02 DEPOT-TAB OCCURS 300 TIMES COMP-3.
               16              03 DEPOT                  PIC 9(5).
                               03 ATTRIT                 PIC 9(5).
          *
          **   18   01   JCNMAX.
               19        02 JCNMAX-DATE                  PIC 9(5).
               20        02 JCNMAX-SEQUENCE              PIC 9(3).
                         02 JCNMAX-SUFFIX                PIC X(2).
          *
          **   01   01   COUNT2-TABLE.
                         02 COUNT2-TAB OCCURS 200 TIMES.
```

```
                   03 KOUNT2                  PIC 9(3).
   *
   **  05   01  JCNO-TABLE.
                02 JCNO-TEST OCCURS 200 TIMES.
                   03 MI2DTE                  PIC 9(5).
       07          03 JCNO.
                      04 JCNO-NUM.
                         05 JCNO-DATE         PIC 9(5).
                         05 JCNO-SEQUENCE        PIC 9(3).
       10             04 JCNO-SUFFIX          PIC X(2).
       11          03  JCNO-TAG               PIC X.
   *
   **  13   01  COUNT1-TABLE.
                02 COUNT1-TAB OCCURS 200 TIMES.
                     03 KOUNT1                PIC 9(3).
   *
            01  ERROR-MESSAGE-TABLE.
                02 ERROR-MESSAGE.
                   03 FILLER                  PIC X(45) VALUE
                         'INPUT VALUES ARE MISSING                    '.
                   03 FILLER                  PIC X(45) VALUE
                         'NUMBER OF WU-CODES IS ) SPECIFIED           '.
                   03 FILLER                  PIC X(45) VALUE
                         'RANGE VALUE OF CAUSATIVE WU-CODES IS MISSING '.
                   03 FILLER                  PIC X(45) VALUE
                         'NUMBER OF CAUSATIVE WU-CODES IS ) SPECIFIED  '.
                   03 FILLER                  PIC X(45) VALUE
                         'RANGE VALUE OF LABOR-COSTS IS MISSING       '.
                   03 FILLER                  PIC X(45) VALUE
                         'NUMBER OF LABORS-COSTS IS ) SPECIFIED       '.
                   03 FILLER                  PIC X(45) VALUE
                         'INPUT FUNC RELATIONS IS ) SPECIFIED         '.
                   03 FILLER                  PIC X(45) VALUE
                         'INVALID WRITE TO S-FILE                     '.
                   03 FILLER                  PIC X(45) VALUE
                         'INVALID WRITE TO 2BC-LIST-FILE              '.
                   03 FILLER                  PIC X(45) VALUE
                         'INVALID WRITE TO 2A-LIST-FILE               '.
                   03 FILLER                  PIC X(45) VALUE
                         'RESTART-FILE HAS ENDED                      '.
                02 ERR-TAB REDEFINES ERROR-MESSAGE OCCURS 11 TIMES.
                   03 ERR-MSG                 PIC X(45).
   +++
            01  HEADING-1.
                02 FILLER    PIC X(44) VALUE SPACE.
                02 FILLER    PIC X(22) VALUE 'F A I L U R E - T O - '.
                02 FILLER    PIC X(21) VALUE 'A C K N O W L E D G E'.
                02 FILLER    PIC X(45) VALUE SPACE.
            01  HEADING-2.
                02 FILLER    PIC X(20) VALUE '     WORK-UNIT CODE  '.
                02 FILLER    PIC X(20) VALUE '           ACTION    '.
                02 FILLER    PIC X(20) VALUE '      MMH-TIME       '.
                02 FILLER    PIC X(20) VALUE '  NORMU-TIME         '.
                02 FILLER    PIC X(30) VALUE ' NORS-TIME          AWM-TIME   '.
                02 FILLER    PIC X(22) VALUE '        LABOR COST    '.
            01  HEADING-3.
                02 FILLER    PIC X(30) VALUE SPACE.
                02 FILLER    PIC X(15) VALUE '(QTY)          '.
                02 FILLER    PIC X(30) VALUE ' (HOURS)            (HOURS)   '.
                02 FILLER    PIC X(25) VALUE '         (HOURS)          '.
                02 FILLER    PIC X(20) VALUE '(HOURS)             '.
                02 FILLER    PIC X(12) VALUE '($)         '.
            01  HEADING-4.
                02 FILLER    PIC X(47) VALUE SPACE.
                02 FILLER    PIC X(22) VALUE 'F A I L U R E - T O -'.
                02 FILLER    PIC X(15) VALUE 'D I A G N O S E'.
                02 FILLER    PIC X(48) VALUE SPACE.
            01  HEADING-5.
                02 FILLER    PIC X(15) VALUE SPACE.
                02 FILLER    PIC X(10) VALUE 'F A L S E '.
                02 FILLER    PIC X(25) VALUE ' A L A R M   A C T I O N S'.
                02 FILLER    PIC X(36) VALUE SPACE.
                02 FILLER    PIC X(37) VALUE 'A C C E S S   A C T I O N S'.
                02 FILLER    PIC X(20) VALUE SPACE.
            01  HEADING-6.
                02 FILLER                  PIC X VALUE SPACE.
                02 FILLER    PIC X(4)   VALUE 'WORK'.
```

```
               02 FILLER                   PIC X(53) VALUE SPACE.
               02 FILLER    PIC X(5)  VALUE 'LABOR'.
               02 FILLER    PIC X(61) VALUE SPACE.
               02 FILLER    PIC X(8)  VALUE 'LABOR   '.
          01   HEADING-7.
               02 FILLER    PIC X(30) VALUE ' UNIT ACTION MMH-TIME NORMU-TI'.
               02 FILLER    PIC X(30) VALUE 'ME  NORS-TIME  AWM-TIME      C'.
               02 FILLER    PIC X(30) VALUE 'OST            ACTION MMH-TIME  N'.
               02 FILLER    PIC X(30) VALUE 'ORMU-TIME  NORS-TIME  AWM-TIME'.
               02 FILLER    PIC X(12) VALUE '     COST   '.
          01   HEADING-8.
               02 FILLER    PIC X(30) VALUE ' CODE  (QTY) (HOURS)     (HOURS'.
               02 FILLER    PIC X(30) VALUE ')      (HOURS)      (HOURS)    ($'.
               02 FILLER    PIC X(30) VALUE ')                  (QTY)  (HOURS)   '.
               02 FILLER    PIC X(30) VALUE ' (HOURS)       (HOURS)      (HOURS)'.
               02 FILLER    PIC X(12) VALUE '      ($)    '.
          01   HEADING-9.
               02 FILLER    PIC X(48) VALUE SPACE.
               02 FILLER    PIC X(22) VALUE 'F A I L U R E - T O - '.
               02 FILLER    PIC X(13) VALUE 'C O R R E C T'.
               02 FILLER    PIC X(49) VALUE SPACE.
          01   HEADING-10.
               02 FILLER    PIC X(20) VALUE '  WORK-UNIT CODE    '.
               02 FILLER    PIC X(20) VALUE '     ACTION         '.
               02 FILLER    PIC X(15) VALUE 'MMH-TIME       '.
               02 FILLER    PIC X(15) VALUE 'NORMU-TIME     '.
               02 FILLER    PIC X(30) VALUE '   NORS-TIME          AWM-TIME    '.
               02 FILLER    PIC X(15) VALUE '    LABOR COST  '.
               02 FILLER    PIC X(17) VALUE '    MATERIAL COST '.
          01   HEADING-11.
               02 FILLER    PIC X(25) VALUE SPACE.
               02 FILLER    PIC X(24) VALUE '(QTY)               (HOURS) '.
               02 FILLER    PIC X(20) VALUE '           (HOURS)    '.
               02 FILLER    PIC X(30) VALUE '      (HOURS)            (HOURS)    '.
               02 FILLER    PIC X(20) VALUE '         ($)      '.
               02 FILLER    PIC X(12) VALUE '     ($)      '.
          01   HEADING-12.
               02 FILLER    PIC X(22) VALUE SPACE.
               02 FILLER    PIC X(15) VALUE 'D E F E C T S  '.
               02 FILLER    PIC X(13) VALUE 'I N D U C E D'.
               02 FILLER    PIC X(21) VALUE '  I N T E R N A L L Y'
               02 FILLER    PIC X(5)  VALUE '  B Y'.
               02 FILLER    PIC X(21) VALUE '  C O R R E C T I V E'.
               02 FILLER    PIC X(13) VALUE '  A C T I O N'.
               02 FILLER    PIC X(22) VALUE SPACE.
          01   HEADING-13.
               02 FILLER                   PIC X VALUE SPACE.
               02 FILLER    PIC X(4)  VALUE 'WORK'.
               02 FILLER                   PIC X(55) VALUE SPACE.
               02 FILLER    PIC X(20) VALUE 'O & I        O & I   '.
               02 FILLER    PIC X(30) VALUE '       DEPOT             DEPOT       '.
               02 FILLER    PIC X(22) VALUE '  DEPOT        I-LEVEL  '.
          01   HEADING-14.
               02 FILLER    PIC X(30) VALUE ' UNIT ACTION  MMH-TIME  NORMU-'.
               02 FILLER    PIC X(30) VALUE 'TIME  NORS-TIMF  AWM-TIMF  LAB'.
               02 FILLER    PIC X(30) VALUE 'OR COST   MAT. COST      LABOR'.
               02 FILLER    PIC X(30) VALUE '           MATERIAL    TRANSPORT. '.
               02 FILLER    PIC X(12) VALUE '   DISCARD  '.
          01   HEADING-15.
               02 FILLER    PIC X(30) VALUE ' CODE  (QTY)    (HOURS)      (HOU'.
               02 FILLER    PIC X(30) VALUE 'RS)     (HOURS)        (HOURS)    '.
               02 FILLER    PIC X(30) VALUE ' ($)               ($)          ($) '.
               02 FILLER    PIC X(30) VALUE '               ($)           ($)    '.
               02 FILLER    PIC X(12) VALUE '      ($)    '.
 ***
          01   DETAIL-LINE-1.
               02 FILLER                   PIC X(9)  VALUE SPACE.
               02 DL-WUC                   PIC X(5).
               02 FILLER                   PIC X(14) VALUE SPACE.
               02 DL-ACT                   PIC Z(3)9.
               02 FILLER                   PIC X(11) VALUE SPACE.
               02 DL-MMH                   PIC Z(8).9.
               02 FILLER                   PIC X(9)  VALUE SPACE.
               02 DL-NORMU                 PIC Z(8).9.
               02 FILLER                   PIC X(8) VALUE SPACE.
               02 DL-NORS                  PIC Z(8).9.
               02 FILLER                   PIC X(7) VALUE SPACE.
```

```
11        PROG3B        03.48.26        10/26/78

00770               02 D1-AWM                     PIC Z(8).9.
00771               02 FILLER                     PIC X(8)  VALUE SPACE.
00772               02 D1-LABOR                   PIC Z(8).99.
00773               02 FILLER                     PIC X(6)  VALUE SPACE.
00774          01   DETAIL-LINE-2.
00775               02 FILLER                     PIC X VALUE SPACE.
00776               02 D2-WUC                     PIC X(5).
00777               02 D2-FACT                    PIC Z(3)9.
00778               02 D2-FMMH                    PIC Z(8).9.
00779               02  FILLER                    PIC X  VALUE SPACE.
00780               02 D2-FNORMU                  PIC Z(8).9.
00781               02  FILLER                    PIC X  VALUE SPACE.
00782               02 D2-FNORS                   PIC Z(8).9.
00783               02 D2-FAWM                    PIC Z(8).9.
00784               02 D2-FLABOR                  PIC Z(8).99.
00785               02 FILLER                     PIC X(2)  VALUE SPACE.
00786               02 FILLER                     PIC X(6) VALUE SPACE.
00787               02 D2-AACT                    PIC Z(3)9.
00788               02  FILLER                    PIC X  VALUE SPACE.
00789               02 D2-AMMH                    PIC Z(8).9.
00790               02  FILLER                    PIC XX  VALUE SPACE.
00791               02 D2-ANORMU                  PIC Z(8).9.
00792               02  FILLER                    PIC X  VALUE SPACE.
00793               02 D2-ANORS                   PIC Z(8).9.
00794               02 D2-AAWM                    PIC Z(8).9.
00795               02 D2-ALABOR                  PIC Z(7).99.
00796          01   DETAIL-LINE-3.
00797               02 FILLER                     PIC X(6)  VALUE SPACE.
00798               02 D3-WUC                     PIC X(5).
00799               02 FILLER                     PIC X(12) VALUE SPACE.
00800               02 D3-ACT                     PIC Z(3)9.
00801               02 FILLER                     PIC X(11) VALUE SPACE.
00802               02 D3-MMH                     PIC Z(8).9.
00803               02 FILLER                     PIC X(7) VALUE SPACE.
00804               02 D3-NORMU                   PIC Z(8).9.
00805               02 FILLER                     PIC X(6) VALUE SPACE.
00806               02 D3-NORS                    PIC Z(8).9.
00807               02 FILLER                     PIC X(5) VALUE SPACE.
00808               02 D3-AWM                     PIC Z(8).9.
00809               02 FILLER                     PIC X(6)  VALUE SPACE.
00810               02 D3-LABOR                   PIC Z(8).99.
00811               02 FILLER                     PIC X(7)  VALUE SPACE.
00812               02 D3-MATERIAL                PIC Z(8).99.
00813               02 FILLER                     PIC X     VALUE SPACE.
00814          01   DETAIL-LINE-4.
00815               02 FILLER                     PIC X VALUE SPACE.
00816               02 D4-WUC                     PIC X(5).
00817               02 FILLER                     PIC X VALUE SPACE.
00818               02 D4-ACT                     PIC Z(3)9.
00819               02 FILLER                     PIC X VALUE SPACE.
00820               02 D4-MMH                     PIC Z(8).9.
00821               02  FILLER                    PIC XX VALUE SPACE.
00822               02 D4-NORMU                   PIC Z(8).9.
00823               02 FILLER                     PIC X(1) VALUE SPACE.
00824               02 D4-NORS                    PIC Z(8).9.
00825               02 D4-AWM                     PIC Z(8).9.
00826               02 FILLER                     PIC X(1) VALUE SPACE.
00827               02 D4-OT-LABOR                PIC Z(8).99.
00828               02 FILLER                     PIC X(1) VALUE SPACE.
00829               02 D4-OT-MATERIAL             PIC Z(8).99.
00830               02 D4-LABOR                   PIC Z(8).99.
00831               02 FILLER                     PIC X(4)  VALUE SPACE.
00832               02 D4-MATERIAL                PIC Z(8).99.
00833               02 FILLER                     PIC X(3)  VALUE SPACE.
00834               02 D4-TRANSPORT               PIC Z(8).99.
00835               02 D4-DISCARD                 PIC Z(8).99.
00836               02 FILLER                     PIC X(2)  VALUE SPACE.
00837          01   DETAIL-LINE REDEFINES DETAIL-LINE-4.
00838               05  FILLER                    PIC X(132).
00839          01   DETAIL-LINE2 REDEFINES DETAIL-LINE.
00840               05  FILLER                    PIC X(51).
00841               05  D-HDR                     PIC X(29).
00842               05  FILLER                    PIC X(52).
00843          01   DETAIL-LINE3 REDEFINES DETAIL-LINE.
00844               05  FILLER                    PIC X(7).
00845               05  D-TITLE1                  PIC X(14).
00846               05  D-DATAS                   PIC X(2).
```

```
                  05  D-TITLE2                       PIC X(26).
                  05  FILLER                         PIC X(83).
              01  DETAIL-LINE4 REDEFINES DETAIL-LINE.
                  05  FILLER                         PIC X(10).
                  05  D-DATA1                        PIC ZZZ.
                  05  FILLER                         PIC X(42).
                  05  D-DATA2                        PIC X(5).
                  05  FILLER                         PIC X(72).
              01  DETAIL-LINE5 REDEFINES DETAIL-LINE.
                  05  FILLER                         PIC X(10).
                  05  D-DATA3                        PIC XXXX.
                  05  FILLER                         PIC X(39).
                  05  D-DATA4                        PIC ZZZZZZ.99.
                  05  FILLER                         PIC X(70).
              01  DETAIL-LINE6 REDEFINES DETAIL-LINE.
                  05  FILLER                         PIC X(7).
                  05  D-TITLE3                       PIC X(14).
                  05  FILLER                         PIC XXX.
                  05  D-TITLE4                       PIC X(9).
                  05  FILLER                         PIC XXX.
                  05  D-TITLE5                       PIC X(12).
                  05  FILLER                         PIC XXX.
                  05  D-TITLE6                       PIC X(12).
                  05  FILLER                         PIC XXX.
                  05  D-TITLE7                       PIC X(14).
                  05  FILLER                         PIC XXX.
                  05  D-TITLE8                       PIC X(20).
                  05  FILLER                         PIC XXX.
                  05  D-TITLE9                       PIC X(15).
                  05  FILLER                         PIC X(12).
              01  DETAIL-LINE7 REDEFINES DETAIL-LINE.
                  05  FILLER                         PIC X(10).
                  05  D-DATA6                        PIC XXXX.
                  05  FILLER                         PIC X(10).
                  05  D-DATA7                        PIC ZZZZZZ.99.
                  05  FILLER                         PIC X(6).
                  05  D-DATA8                        PIC ZZZZZZ.99.
                  05  FILLER                         PIC X(5).
                  05  D-DATA9                        PIC ZZZZZZ.99.
                  05  FILLER                         PIC X(8).
                  05  D-DATA10                       PIC ZZZZZZ.99.
                  05  FILLER                         PIC X(14).
                  05  D-DATA11                       PIC ZZZZZZ.99.
                  05  FILLER                         PIC X(9).
                  05  D-DATA12                       PIC ZZZZZZ.99.
                  05  FILLER                         PIC X(12).
 ***
              01  TOT-TABLE-1.
                  02  TOTACT-1                       PIC 9(4).
                  02  TOTMMH-1                       PIC 9(8)V9.
                  02  TOTMU-1                        PIC 9(8)V9.
                  02  TOTS-1                         PIC 9(8)V9.
                  02  TOTAWM-1                       PIC 9(8)V9.
                  02  TOTTCST-1                      PIC 9(8)V99.
                  02  TOTMCOST                       PIC 9(8)V99.
                  02  TOTDLCST                       PIC 9(8)V99.
                  02  TOTDMCST                       PIC 9(8)V99.
                  02  TOTDTCST                       PIC 9(8)V99.
                  02  TOTACST                        PIC 9(8)V99.
              01  TOT-TABLE-2.
                  02  TOTACT-2                       PIC 9(4).
                  02  TOTMMH-2                       PIC 9(8)V9.
                  02  TOTMU-2                        PIC 9(8)V9.
                  02  TOTS-2                         PIC 9(8)V9.
                  02  TOTAWM-2                       PIC 9(8)V9.
                  02  TOTTCST-2                      PIC 9(8)V99.
 ***
              01  LINE-COUNT                         PIC 9(2).
 ***
 **        01  PROCEDURE DIVISION.
           02  OPEN-FILES-SECTION.
           03      OPEN INPUT  JPW-FILE
           04                  JSW-FILE
           05                  JW-FILE
                               S-FILE
                                  MATRIX-FILE
                                INPUT-CARD-FILE1
```

```
   06            OUTPUT PRINT-FILE.
             OPEN I-O 2BC-LIST-FILE.
             OPEN I-O 2A-LIST-FILE.
             MOVE ZERO TO ABUFFER-TABLE.
             MOVE ZERO TO SBUFFER-TABLE.
             MOVE LOW-VALUE TO JBW-NOMINAL-KEY.
             MOVE LOW-VALUE TO JW-NOMINAL-KEY.
             MOVE LOW-VALUE TO JSW-NOMINAL-KEY.
             MOVE LOW-VALUE TO MATRIX-NOMINAL-KEY.
             MOVE LOW-VALUE TO 2BC-NOM-KEY.
             MOVE LOW-VALUE TO 2A-NOM-KEY.
   07    PRELIM-SECTION.
   08        MOVE ZERO TO J.
   09        MOVE ZERO TO I.
   10        MOVE ZERO TO K.
   11        MOVE ZERO TO L.
             MOVE ZERO TO CHECK-PT-REC-COUNT.
             READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC1 AT END
                                              MOVE 1 TO ERR-IDX
   12                                         PERFORM ERR-RTN THRU ERR-EXIT
   13                                         GO TO END-JOB.
             EXAMINE INPUT-VALUE1E REPLACING ALL SPACES BY ZERO.
   14        MOVE INPUT-VALUE1 TO NSWUC.
   15    READ-SWUC-VALUES.
             MOVE ZERO TO CARD-COUNT.
             READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC2 AT END
                                              MOVE 2 TO ERR-IDX
                                              PERFORM ERR-RTN THRU ERR-EXIT
   20                                         GO TO END-JOB.
         SWUC-INCR-J.
** 16        ADD 1 TO J.
             IF J IS GREATER THAN NSWUC GO TO PREP-FOR-NFWUC.
             ADD 1 TO CARD-COUNT.
             IF CARD-COUNT IS GREATER THAN 11 SUBTRACT 1 FROM J
                                                  GO TO READ-SWUC-VALUES.
             MOVE INPUT-VALUE2 (CARD-COUNT) TO SWUC (J).
             GO TO SWUC-INCR-J.
         PREP-FOR-NFWUC.
             READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC1 AT END
                                              MOVE 3 TO ERR-IDX
** 01                                         PERFORM ERR-RTN THRU ERR-EXIT
   02                                         GO TO END-JOB.
             EXAMINE INPUT-VALUE1E REPLACING ALL SPACES BY ZERO.
             MOVE INPUT-VALUE1 TO NFWUC.
   04        IF NFWUC = ZERO GO TO PREP-FOR-NFDWUC.
   05    READ-FWUC-VALUES.
             MOVE ZERO TO CARD-COUNT.
             READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC2 AT END
                                              MOVE 4 TO ERR-IDX
                                              PERFORM ERR-RTN THRU ERR-EXIT
   10                                         GO TO END-JOB.
         FWUC-INCR-I.
             ADD 1 TO I.
             IF I IS GREATER THAN NFWUC GO TO PREP-FOR-NFDWUC.
             ADD 1 TO CARD-COUNT.
             IF CARD-COUNT IS GREATER THAN 11 SUBTRACT 1 FROM I
                                                  GO TO READ-FWUC-VALUES.
             MOVE INPUT-VALUE2 (CARD-COUNT) TO FWUC (I).
             GO TO FWUC-INCR-I.
   13    PREP-FOR-NFDWUC.
             READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC1 AT END
                                              MOVE 5 TO ERR-IDX
                                              PERFORM ERR-RTN THRU ERR-EXIT
   16                                         GO TO END-JOB.
             EXAMINE INPUT-VALUE1E REPLACING ALL SPACES BY ZERO.
   17        MOVE INPUT-VALUE1 TO NFDWUC.
   19    READ-MAINTCOSTS.
** 18        ADD 1 TO L.
             IF L IS GREATER THAN NFDWUC GO TO ZERO-A2-COSTS.
             READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC3 AT END
                                              MOVE 6 TO ERR-IDX
                                              PERFORM ERR-RTN THRU ERR-EXIT
                                              GO TO END-JOB.
             EXAMINE INPUT-LE REPLACING ALL SPACES BY ZERO.
             MOVE INPUT-L TO LCOST (L).
             EXAMINE INPUT-ME REPLACING ALL SPACES BY ZERO.
             MOVE INPUT-M TO MCOST (L).
```

```
                EXAMINE INPUT-DLE REPLACING ALL SPACES BY ZERO.
                MOVE INPUT-DL TO DLCOST (L).
                EXAMINE INPUT-DME REPLACING ALL SPACES BY ZERO.
                MOVE INPUT-DM TO DMCOST (L).
                EXAMINE INPUT-DTE REPLACING ALL SPACES BY ZERO.
                MOVE INPUT-DT TO DTCOST (L).
                EXAMINE INPUT-ATE REPLACING ALL SPACES BY ZERO.
                MOVE INPUT-AT TO ATCOST (L).
 **     07      GO TO READ-MAINTCOSTS.
            ZERO-A2-COSTS.
                DISPLAY 'IS THIS A RESTART ' UPON CONSOLE.
                ACCEPT RESTART-ANS FROM CONSOLE.
                DISPLAY 'HOW MANY RECORDS TO NEXT CHECKPOINT ' UPON CONSOLE.
                ACCEPT NEXT-CHECK-POINT FROM CONSOLE.
                IF RESTART-ANS = 'N' NEXT SENTENCE ELSE
                                PERFORM RESTART THRU RESTART-END
                                GO TO INCR-J.
                MOVE ZERO TO J.
            INCR-J-FOR-A2.
                ADD 1 TO J.
                IF J IS GREATER THAN NSWUC GO TO TOP-OF-PAGE.
                MOVE ZERO TO A2ACT (J), A2MMH (J), A2MU (J), A2S (J),
                             A2AWM (J).
                MOVE ZERO TO SACT (J), SMMH (J), SMU (J), SS (J), SAWM (J).
                MOVE ZERO TO A1ACT (J), CACT (J), DACT (J),
                             A1MMH (J), CMMH (J), DMMH (J),
                             A1MU (J), CMU (J), DMU (J),
                             A1S (J), CS (J), DS (J),
                             A1AWM (J), CAWM (J), DAWM (J),
                             DEPOT (J), ATTRIT (J).
                GO TO INCR-J-FOR-A2.
          11 *
          12 *
          13 *
            TOP-OF-PAGE.
                MOVE ZERO TO LINE-COUNT.
                MOVE SPACES TO DETAIL-LINE.
                MOVE HDR1 TO D-HDR.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                      AFTER POSITIONING 0 LINES.
                MOVE SPACES TO DETAIL-LINE.
                MOVE ALL '-' TO D-HDR.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                      AFTER POSITIONING 1 LINES.
                MOVE SPACES TO DETAIL-LINE.
                MOVE 'SUBJECT WUC = ' TO D-TITLE1.
                MOVE SWUC (1) TO D-DATA5.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                      AFTER POSITIONING 3 LINES.
            FWUC-HEADER.
                MOVE SPACES TO DETAIL-LINE.
                MOVE 'FUNCTIONAL WORK UNIT CODES' TO D-TITLE2.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                      AFTER POSITIONING 2 LINES.
                MOVE ALL '-' TO D-TITLE2.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                      AFTER POSITIONING 1 LINES.
                MOVE SPACES TO DETAIL-LINE.
                MOVE '  INDEX       ' TO D-TITLE1.
                MOVE '     WUC                    ' TO D-HDR.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                      AFTER POSITIONING 2 LINES.
                MOVE SPACES TO DETAIL-LINE.
                MOVE '  -----       ' TO D-TITLE1.
                MOVE '     ---                    ' TO D-HDR.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                      AFTER POSITIONING 1 LINES.
            TOP-OF-PAGE-END.
                MOVE 1 TO I.
            FWUC-PRINT.
                IF  LINE-COUNT IS GREATER THAN 30
                     PERFORM TOP-OF-PAGE
                     PERFORM  FWUC-HEADER.
                MOVE SPACES TO DETAIL-LINE.
                MOVE I TO D-DATA1.
                MOVE FWUC (I) TO D-DATA2.
                WRITE PRINT-RECORD FROM DETAIL-LINE
```

```
                     AFTER POSITIONING 2 LINES.
                ADD 1 TO LINE-COUNT.
                ADD 1 TO I.
                IF  I IS GREATER THAN NFWUC
                     NEXT SENTENCE
                ELSE
                     GO TO FWUC-PRINT.
                PERFORM TOP-OF-PAGE.
            MCOST-HEADER.
                MOVE SPACES TO DETAIL-LINE.
                MOVE '  AVERAGE MAINTENANCE COSTS' TO D-HDR.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 2 LINES.
                MOVE SPACES TO DETAIL-LINE.
                MOVE 'FOUR-DIGIT-WUC' TO D-TITLE3.
                MOVE 'O&I LABOR' TO D-TITLE4.
                MOVE 'O&I MATERIAL' TO D-TITLE5.
                MOVE ' DEPOT LABOR' TO D-TITLE6.
                MOVE 'DEPOT MATERIAL' TO D-TITLE7.
                MOVE 'DEPOT TRANSPORTATION' TO D-TITLE8.
                MOVE 'I-LEVEL DISCARD' TO D-TITLE9.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 2 LINES.
                MOVE SPACES TO DETAIL-LINE.
                MOVE ' ($/HOUR)' TO D-TITLE4.
                MOVE ' ($/ACTION)' TO D-TITLE5.
                MOVE '($/TRANSFER)' TO D-TITLE6.
                MOVE ' ($/TRANSFER)' TO D-TITLE7.
                MOVE '      ($/TRANSFER)' TO D-TITLE8.
                MOVE '    ($/ATTRIT)' TO D-TITLE9.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 1 LINES.
                MOVE SPACES TO DETAIL-LINE.
                MOVE SPACES TO PREV-SWUC-DIGIT4.
                MOVE ZERO TO K.
                MOVE 1 TO I.
            MCOST-PRINT.
                IF  LINE-COUNT IS GREATER THAN 30
                     PERFORM TOP-OF-PAGE
                     PERFORM MCOST-HEADER.
                MOVE SWUC (I) TO SWUC-DIGIT4.
                IF   SWUC-DIGIT4 = PREV-SWUC-DIGIT4
                     ADD 1 TO I
                     GO TO MCOST-PRINT.
                MOVE SWUC-DIGIT4 TO PREV-SWUC-DIGIT4.
                ADD 1 TO K.
                MOVE SPACES TO DETAIL-LINE.
                MOVE PREV-SWUC-DIGIT4 TO D-DATA6.
                MOVE LCOST  (K) TO D-DATA7.
                MOVE MCOST  (K) TO D-DATA8.
                MOVE DLCOST (K) TO D-DATA9.
                MOVE DMCOST (K) TO D-DATA10.
                MOVE DICOST (K) TO D-DATA11.
                MOVE AICOST (K) TO D-DATA12.
                WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 2 LINES.
                ADD 1 TO LINE-COUNT.
                ADD 1 TO I.
                IF  K = NFDWUC
                     NEXT SENTENCE
                ELSE
                     GO TO MCOST-PRINT.
     14     START-PROCESS.
                MOVE SPACES TO DETAIL-LINE.
     15         MOVE ZERO TO J.
     16     INCR-J.
     17         ADD 1 TO J.
                IF CHECK-PT-REC-COUNT IS NOT LESS THAN NEXT-CHECK-POINT
                                         PERFORM CHECK-POINT
                                         THRU CHECK-POINT-END
                DISPLAY ' RUN ISKEYRED NEXT             ' UPON CONSOLE
                                         GO TO END-JOB.
                IF J IS GREATER THAN NSWUC PERFORM COST-RTN THRU
                                                  COST-RTN-END
     19                       PERFORM PRINT-RTN THRU PRINT-RTN-END
                DISPLAY ' IT IS FINALLY OVER, THANK YOU.' UPON CONSOLE
     20                       GO TO END-JOB.
```

```
 **     01   PREP-FOR-JBW.
                  MOVE SWUC (J) TO GEN-JBW-KEY1-WUC.
                  START JBW-FILE KEY = GEN-JBW-KEY1 INVALID KEY GO TO INCR-J.
        08   READ-JBW.
                  READ JBW-FILE AT END GO TO INCR-J.
                  ADD 1 TO REC-CNT.
                  IF REC-CNT = CTRR
                      ADD 1000 TO CTRR
                      DISPLAY 'PROCESSED RECORDS ' REC-CNT UPON CONSOLE.
                  ADD 1 TO CHECK-PT-REC-COUNT.
                  IF JBW-WU-CODE NOT = SWUC (J) GO TO INCR-J.
                  MOVE JBW-BUREAU-NUMBER TO BUNOKEY.
                  IF JBW-ATC-LEVEL1 = 'A' GO TO CHECK-SECOND-TIME.
                  IF JBW-ATC-LEVEL1 = 'B' GO TO CHECK-SECOND-TIME.
                  IF JBW-ATC-LEVEL1 = 'C' GO TO CHECK-SECOND-TIME.
        18        IF JBW-ATC-LEVEL1 = 'R' NEXT SENTENCE ELSE GO TO READ-JBW.
        19   TEST-2BC-LIST.
        20        MOVE JBW-BUREAU-NUMBER TO TEST-2BC-BN.
                  MOVE JBW-JCN TO TEST-2BC-JCN.
                  PERFORM SEARCH-2BC-RECORDS THRU SEARCH-END.
                  IF  SWT-2BC = 'N' NEXT SENTENCE
                                 ELSE GO TO READ-JBW.
             CHECK-SECOND-TIME.
 **     01        MOVE JBW-JCN TO JCNKEY.
                  IF JBW-ATC-LEVEL1 = 'B' GO TO TEST-ATC-LEVEL1.
                  IF JBW-ATC-LEVEL1 = 'C' GO TO TEST-ATC-LEVEL1.
                  IF JBW-ATC-LEVEL1 = 'R' GO TO TEST-ATC-LEVEL1:
        05        MOVE 1 TO COUNT.
        06        MOVE JBW-MMH-LEVEL1 TO BUFMMH.
        07        MOVE JBW-NORMU-TIME TO BUFMU.
        08        MOVE JBW-NORS-TIME TO BUFS.
        09        MOVE JBW-AWM-TIME TO BUFAWM.
        10   SET-MLI-DATE.
                  MOVE JBW-MLI-DATE TO MLIDAT.
        14   READ-JBW-AGAIN.
                  READ JBW-FILE AT END GO TO READ-JBW2.
        17        IF JBW-WU-CODE NOT = SWUC(J) GO TO READ-JBW2.
 **     16        IF JBW-BUREAU-NUMBER NOT = BUNOKEY GO TO READ-JBW2.
        18        IF JBW-ATC-LEVEL1 = 'A' GO TO TEST-JCN-DATE.
        19        IF JBW-ATC-LEVEL1 = 'B' GO TO TEST-JCN-DATE.
        20        IF JBW-ATC-LEVEL1 = 'C' GO TO TEST-JCN-DATE.
                  IF JBW-ATC-LEVEL1 = 'R' GO TO TEST-JCN-DATE.
                  GO TO READ-JBW-AGAIN.
             TEST-JCN-DATE.
                  MOVE MLIDAT TO SUB-BUFFER-DATE1.
                  MOVE JBW-JCN-DATE TO SUB-BUFFER-DATE2.
                  PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
                  IF DATE-DIFF IS NOT LESS THAN ZERO AND
                      DATE-DIFF IS NOT GREATER THAN 3
 **     02                                      NEXT SENTENCE
                                                     ELSE GO TO READ-JBW-AGAIN.
                  IF JBW-ATC-LEVEL1 = 'A' GO TO INCR-COUNT.
        06        ADD COUNT TO A1ACT(J).
                  ADD BUFMMH TO A1MMH (J).
        08        ADD BUFMU TO A1MU(J):
        09        ADD BUFS TO A1S(J).
        10        ADD BUFAWM TO A1AWM(J).
        11   READ-JBW2.
        12        MOVE SWUC(J) TO JBW-WU-CODE.
        13        MOVE BUNOKEY TO JBW-BUREAU-NUMBER.
        14        MOVE JCNKEY TO JBW-JCN.
                  START JBW-FILE KEY = JBW-KEY INVALID KEY GO TO INCR-J.
                  READ JBW-FILE AT END GO TO INCR-J.
        16        GO TO READ-JBW.
        17   INCR-COUNT.
        18        ADD 1 TO COUNT.
                  ADD JBW-MMH-LEVEL1 TO BUFMMH.
                  ADD JBW-NORMU-TIME TO BUFMU.
                  ADD JBW-NORS-TIME TO BUFS.
                  ADD JBW-AWM-TIME TO BUFAWM.
                  GO TO SET-MLI-DATE.
 **     01   TEST-ATC-LEVEL1.
                  IF JBW-ATC-LEVEL1 = 'R' AND JBW-ATC-LEVEL2 = 'A'
                                              GO TO TEST-NFWUC.
                  IF JBW-ATC-LEVEL1 NOT = 'R' GO TO MOVE-JBW-TO-GENERIC.
                  IF JBW-ATC-LEVEL2 = 'B' GO TO MOVE-JBW-TO-GENERIC.
                  IF JBW-ATC-LEVEL2 = 'C' GO TO MOVE-JBW-TO-GENERIC.
```

```
                   IF JBW-ATC-LEVEL2 NOT LESS THAN '1' AND
                       JBW-ATC-LEVEL2 NOT GREATER THAN '8'
                                      GO TO MOVE-JBW-TO-GENERIC.
               GO TO READ-JBW2.
           MOVE-JBW-TO-GENERIC.
               MOVE JBW-WU-CODE TO GEN-WUC.
               MOVE JBW-JCN TO GEN-JCN.
               MOVE JBW-TF-CODE TO GEN-TF-CODE.
               MOVE JBW-SERIAL-NUMBER TO GEN-SERIAL-NUMBER.
               MOVE JBW-BUREAU-NUMBER TO GEN-BUREAU-NUMBER.
               MOVE JBW-GENERIC TO REST-OF-GENERIC.
       14  ZERO-COUNT.
       15      MOVE ZERO TO COUNT.
               MOVE ZERO TO BUFFER.
       17  LOAD-BUFFER2.
       19      MOVE ZERO TO SWITCH.
               MOVE GEN-MMH-LEVEL1 TO BUFMMH2.
               MOVE GEN-NORMU-TIME TO BUFMU2.
               MOVE GEN-NORS-TIME TO BUFS2.
               MOVE GEN-AWM-TIME TO BUFAWM2.
               IF GEN-ATC-LEVEL1 = 'R' GO TO ADD-MMH-LEVEL2.
   **  01      MOVE ZERO TO K.
       02  SEARCH-HMC-LIST.
       03      ADD 1 TO K.
                IF K IS GREATER THAN NHMC GO TO MLIDAT-SET.
               IF JBW-HMC-LEVEL1 = HMC (K) MOVE 1 TO SWITCH
       06                                   ELSE GO TO SEARCH-HMC-LIST.
       07  MLIDAT-SET.
               MOVE JBW-MLI-DATE TO MLIDAT.
           READ-JBW-NEXT.
               READ JBW-FILE AT END GO TO ADD-TO-CACT.
       10      IF JBW-WU-CODE NOT = SWUC(J) GO TO ADD-TO-CACT.
       11      IF JBW-BUREAU-NUMBER NOT = BUNOKEY GO TO ADD-TO-CACT.
               MOVE MLIDAT TO SUB-BUFFER-DATE1.
               MOVE JBW-JCN-DATE TO SUB-BUFFER-DATE2.
               PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
               IF DATE-DIFF IS GREATER THAN 3 GO TO ADD-TO-CACT.
               IF DATE-DIFF IS LESS THAN ZERO GO TO ADD-TO-CACT.
               IF JBW-ATC-LEVEL1 = 'B' PERFORM MOVE-JBW-TO-GENERIC
                                        GO TO SET-JCN-KEY.
               IF JBW-ATC-LEVEL1 = 'C' PERFORM MOVE-JBW-TO-GENERIC
                                        GO TO SET-JCN-KEY.
               IF JBW-ATC-LEVEL1 NOT = 'R' GO TO ADD-TO-CACT.
               IF JBW-ATC-LEVEL2 = 'B' GO TO SEARCH-2BC-LIST.
               IF JBW-ATC-LEVEL2 = 'C' GO TO SEARCH-2BC-LIST.
               IF JBW-ATC-LEVEL2 NOT LESS THAN '1' AND
                   JBW-ATC-LEVEL2 NOT GREATER THAN '9'
                                   GO TO SEARCH-2BC-LIST.
               GO TO ADD-TO-CACT.
       18  SEARCH-2BC-LIST.
       19      MOVE JBW-BUREAU-NUMBER TO TEST-2BC-BN.
       20      MOVE JBW-JCN TO TEST-2BC-JCN.
               PERFORM SEARCH-2BC-RECORDS THRU SEARCH-END.
               IF SWT-2BC = 'N' PERFORM MOVE-JBW-TO-GENERIC
                                  GO TO SET-JCN-KEY.
   **  03  ADD-TO-CACT.
   **  03      ADD COUNT TO CACT(J).
       04      ADD BUFMMH TO CMMH(J).
       05      ADD BUFMU TO CMU(J).
       06      ADD BUFS TO CS(J).
       07      ADD BUFAWM TO CAWM(J).
       08      GO TO READ-JBW2.
       09  SET-JCN-KEY.
               MOVE JBW-JCN TO JCNKEY.
           SET-SWITCH2-NOW.
       11      MOVE ZERO TO SWITCH2.
       12      MOVE ZERO TO K.
       13  SEARCH-HMC-2.
       14      ADD 1 TO K.
               IF K IS GREATER THAN NHMC GO TO CHECK-LEVEL1.
               IF JBW-HMC-LEVEL1 = HMC (K) GO TO SET-SWITCH2-AGAIN.
       18      GO TO SEARCH-HMC-2.
       19  CHECK-LEVEL1.
       20      IF JBW-ATC-LEVEL1 NOT = 'R' GO TO CHECK-SWITCHES.
               MOVE ZERO TO K.
           SEARCH-HMC-3.
               ADD 1 TO K.
```

```
                  IF K IS GREATER THAN NHMC GO TO CHECK-SWITCHES.
                  IF JBW-HMC-LEVEL2 = HMC (K) GO TO SET-SWITCH2-AGAIN.
**   03           GO TO SEARCH-HMC-3.
              SET-SWITCH2-AGAIN.
                  MOVE 1 TO SWITCH2.
     04       CHECK-SWITCHES.
                  IF SWITCH NOT = SWITCH2 GO TO ADD-TO-C.
                  ADD 1 TO COUNT.
                  MOVE COUNT TO OUT-COUNT.
                  ADD BUFMMH2 TO BUFMMH.
                  ADD BUFS2 TO BUFS.
                  ADD BUFMU2 TO BUFMU.
                  ADD BUFAWM2 TO BUFAWM.
                  IF GEN-ATC-LEVEL2 NOT = '9' GO TO LOAD-BUFFER2.
              ADD-TO-C.
     11           ADD COUNT TO CACT(J).
     12           ADD BUFMMH TO CMMH(J).
     13           ADD BUFMU TO CMU(J).
     14           ADD BUFS TO CS(J).
     15           ADD BUFAWM TO CAWM(J).
                  IF SWITCH2 = SWITCH GO TO READ-JBW2.
                  IF SWITCH2 = ZERO AND GEN-ATC-LEVEL2 NOT = '9'
                                          GO TO ZERO-COUNT.
                  IF SWITCH2 = ZERO GO TO READ-JBW2.
     17           ADD 1 TO DACT(J).
                  ADD GEN-MMH-LEVEL1 TO DMMH (J).
                  ADD GEN-NORMU-TIME TO DMU (J).
                  ADD GEN-NORS-TIME TO DS (J).
                  ADD GEN-AWM-TIME TO DAWM (J).
                  IF GEN-ATC-LEVEL1 = 'R' ADD GEN-MMH-LEVEL2 TO DMMH (J).
                  IF GEN-ATC-LEVEL2 = '9' ADD 1 TO ATTRIT (J)
                                              GO TO READ-JBW2.
                  IF GEN-ATC-LEVEL2 NOT LESS THAN '1' AND
                     GEN-ATC-LEVEL2 NOT GREATER THAN '8'
                                          ADD 1 TO DEPOT (J).
                  GO TO ZERO-COUNT.
     18       ADD-MMH-LEVEL2.
                  ADD GEN-MMH-LEVEL2 TO BUFMMH2.
     20           MOVE ZERO TO K.
              SEARCH-HMC-4.
                  ADD 1 TO K.
                  IF K IS GREATER THAN NHMC GO TO SET-JCNKEY2.
                  IF GEN-HMC-LEVEL1 = HMC (K) MOVE 1 TO SWITCH
                                              GO TO SET-JCNKEY2.
                  IF GEN-HMC-LEVEL2 = HMC (K) MOVE 1 TO SWITCH
**   01                                   GO TO SET-JCNKEY2.
     02           GO TO SEARCH-HMC-4.
     03       SET-JCNKEY2.
                  MOVE GEN-JCN TO JCNKEY2.
                  MOVE GEN-BUREAU-NUMBER TO BUREAU-NUMBER-2BC.
                  MOVE GEN-JCN TO JCN-2BC.
                  WRITE 2BC-RECORD INVALID KEY MOVE 09 TO ERR-IDX
                                      PERFORM ERR-RTN THRU ERR-EXIT.
                  MOVE GEN-ML2-DATE TO ML2DAT.
                  IF GEN-SERIAL-NUMBER = SPACE GO TO SET-MTIME.
                  MOVE GEN-SERIAL-NUMBER TO SERKEY.
                  MOVE GEN-METER-TIME TO MTIME.
     18           MOVE JCNKEY2 TO JSW-JCN.
     19           MOVE SERKEY TO JSW-SERIAL-NUMBER.
     20           MOVE SWUC(J) TO JSW-WU-CODE.
                  START JSW-FILE KEY = JSW-KEY INVALID KEY
                                          GO TO READ-JSW-AGAIN.
                  READ JSW-FILE AT END GO TO READ-JSW-AGAIN.
              READ-JSW-FILE.
                  READ JSW-FILE AT END GO TO READ-JSW-AGAIN.
                  IF JSW-WU-CODE NOT = SWUC (J) GO TO READ-JSW-AGAIN.
**   01           IF JSW-SERIAL-NUMBER NOT = SERKEY GO TO READ-JSW-AGAIN.
     20       TEST-JSW-DATE.
                  MOVE ML2DAT TO SUB-BUFFER-DATE1.
                  MOVE JSW-JCN-DATE TO SUB-BUFFER-DATE2.
                  PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
                  IF DATE-DIFF IS NOT LESS THAN ZERO AND
                     DATE-DIFF IS NOT GREATER THAN 3
                                      GO TO END-TEST-JSW-DATE.
                  IF JSW-METER-TIME NOT = ZERO SUBTRACT MTIME FROM
**   01                                          JSW-METER-TIME GIVING
     02                                      TIME-DIFF
```

```
01386       03                                   ELSE GO TO READ-JSW-AGAIN.
01387                 IF TIME-DIFF IS GREATER THAN ZERO AND
01388                    TIME-DIFF IS NOT GREATER THAN 50
01389                                      GO TO END-TEST-JSW-DATE.
01390                 GO TO READ-JSW-AGAIN.
01391             END-TEST-JSW-DATE.
01392                 IF JSW-ATC-LEVEL1 NOT = 'R' GO TO READ-JSW-AGAIN.
01393                 IF JSW-ATC-LEVEL2 = 'B' GO TO JSW-TEST-2BC.
01394                 IF JSW-ATC-LEVEL2 = 'C' GO TO JSW-TEST-2BC.
01395                 IF JSW-ATC-LEVEL2 NOT LESS THAN '1' AND
01396                    JSW-ATC-LEVEL2 NOT GREATER THAN '9'
01397                                   GO TO JSW-TEST-2BC.
01398                 GO TO READ-JSW-AGAIN.
01399             JSW-TEST-2BC.
01400 **      02      MOVE JSW-BUREAU-NUMBER TO TEST-2BC-BN.
01401         03      MOVE JSW-JCN TO TEST-2BC-JCN.
01402         04      PERFORM SEARCH-2BC-RECORDS THRU SEARCH-END.
01403                 IF SWT-2BC = 'N' NEXT SENTENCE
01404                                ELSE GO TO READ-JSW-AGAIN.
01405             MOVE-JSW-TO-GENERIC.
01406                 MOVE JSW-WU-CODE TO GEN-WUC.
01407                 MOVE JSW-JCN TO GEN-JCN.
01408                 MOVE JSW-TF-CODE TO GEN-TF-CODE.
01409                 MOVE JSW-SERIAL-NUMBER TO GEN-SERIAL-NUMBER.
01410                 MOVE JSW-BUREAU-NUMBER TO GEN-BUREAU-NUMBER.
01411                 MOVE JSW-GENERIC TO REST-OF-GENERIC.
01412         19  SET-SWITCH2.
01413         20      MOVE ZERO TO SWITCH2.
01414                 MOVE ZERO TO K.
01415             SEARCH-DOUBLE-HMC.
01416                 ADD 1 TO K.
01417                 IF K IS GREATER THAN NHMC GO TO END-DOUBLE-HMC.
01418                 IF GEN-HMC-LEVEL1 = HMC (K) MOVE 1 TO SWITCH2
01419                                         GO TO END-DOUBLE-HMC.
01420                 IF GEN-HMC-LEVEL2 = HMC (K) MOVE 1 TO SWITCH2
01421                                         GO TO END-DOUBLE-HMC.
01422 **      06      GO TO SEARCH-DOUBLE-HMC.
01423             END-DOUBLE-HMC.
01424                 GO TO CHECK-SWITCHES.
01425         11  READ-JSW-AGAIN.
01426                 MOVE SWUC (J) TO GEN-JSW-KEY-WUC.
01427                 START JSW-FILE KEY = GEN-JSW-KEY INVALID KEY
01428                                            GO TO ADD-TO-C-TABLE.
01429         15  CONT-READ-JSW.
01430                 READ JSW-FILE AT END GO TO ADD-TO-C-TABLE.
01431                 IF JSW-WU-CODE NOT = SWUC (J) GO TO ADD-TO-C-TABLE.
01432                 IF JSW-SERIAL-NUMBER IS GREATER THAN SPACE
01433                                    GO TO ADD-TO-C-TABLE.
01434                 IF JSW-JCN IS NOT GREATER THAN JCNKEY2 GO TO CONT-READ-JSW.
01435 **      14  CHECK-JSW-DATE.
01436                 MOVE ML2DAT TO SUB-BUFFER-DATE1.
01437                 MOVE JSW-JCN-DATE TO SUB-BUFFER-DATE2.
01438                 PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
01439                 IF DATE-DIFF IS NOT LESS THAN ZERO AND
01440                    DATE-DIFF IS NOT GREATER THAN 3
01441                                   GO TO END CHECK-JSW-DATE.
01442         18      IF JSW-METER-TIME NOT = ZERO SUBTRACT HTIME  FROM
01443         19                                     JSW-METER-TIME GIVING
01444         20                                   TIME-DIFF
01445                                              ELSE GO TO CONT-READ-JSW.
01446                 IF TIME-DIFF IS GREATER THAN ZERO AND
01447                    TIME-DIFF IS NOT GREATER 50
01448                                   GO TO END-CHECK-JSW-DATE.
01449                 GO TO CONT-READ-JSW.
01450             END-CHECK-JSW-DATE.
01451 **      01      IF JSW-ATC-LEVEL1 = 'R' NEXT SENTENCE
01452         02                              ELSE GO TO CONT-READ-JSW.
01453                 IF JSW-ATC-LEVEL2 = 'B' GO TO CHECK-2BC-LIST.
01454                 IF JSW-ATC-LEVEL2 = 'C' GO TO CHECK-2BC-LIST.
01455                 IF JSW-ATC-LEVEL2 NOT LESS THAN '1' AND
01456                    JSW-ATC-LEVEL2 NOT GREATER THAN '9'
01457                                  GO TO CHECK-2BC-LIST.
01458         11      GO TO CONT-READ-JSW.
01459             CHECK-2BC-LIST.
01460         20      MOVE JSW-BUREAU-NUMBER TO TEST-2BC-BN.
01461                 MOVE JSW-JCN TO TEST-2BC-JCN.
01462                 PERFORM SEARCH-2BC-RECORDS THRU SEARCH-END.
```

```
01463                IF SWT-2BC = 'N' PERFORM MOVE-JSW-TO-GENERIC
01464                                 GO TO SET-SWITCH2.
01465                GO TO CONT-READ-JSW.
01466            ADD-TO-C-TABLE.
01467                ADD COUNT TO CACT(J).
01468                ADD BUFMMH TO CMMH(J).
01469                ADD BUFMU TO CMU (J).
01470 **    02       ADD BUFS TO CS(J).
01471       03       ADD BUFAWM TO CAWM(J).
01472                GO TO READ-JBW2.
01473       05   SET-MTIME.
01474                MOVE GEN-METER-TIME TO MTIME.
01475                MOVE SWUC (J) TO JW-WU-CODE.
01476                MOVE JCNKEY2 TO JW-JCN.
01477                START JW-FILE KEY = JW-KEY INVALID KEY GO TO ADD-TO-C-TABLE.
01478                READ JW-FILE AT END GO TO ADD-TO-C-TABLE.
01479       11   READ-JW-FILE.
01480                READ JW-FILE AT END GO TO ADD-TO-C-TABLE.
01481       14       IF JW-WU-CODE NOT = SWUC(J) GO TO ADD-TO-C-TABLE.
01482 **    10   TEST-JW-DATE.
01483                MOVE ML2DAT TO SUB-BUFFER-DATE1.
01484                MOVE JW-JCN-DATE TO SUB-BUFFER-DATE2.
01485                PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
01486                IF DATE-DIFF IS NOT LESS THAN ZERO AND
01487                    DATE-DIFF IS NOT GREATER THAN 3
01488                                   GO TO END-TEST-JW-DATE.
01489       14       IF JW-METER-TIME NOT = ZERO SUBTRACT MTIME FROM JW-METER-TIME
01490       15                                  GIVING TIME-DIFF
01491                                           ELSE GO TO READ-JW-FILE.
01492                IF TIME-DIFF IS GREATER THAN ZERO AND
01493                    TIME-DIFF IS NOT GREATER THAN 50
01494                                   GO TO END-TEST-JW-DATE.
01495                GO TO READ-JW-FILE.
01496            END-TEST-JW-DATE.
01497       20       IF JW-ATC-LEVEL1 = 'R' NEXT SENTENCE
01498                                    ELSE GO TO READ-JW-FILE.
01499                IF JW-ATC-LEVEL2 = 'B' GO TO CHECK-2BC-AGAIN.
01500                IF JW-ATC-LEVEL2 = 'C' GO TO CHECK-2BC-AGAIN.
01501                IF JW-ATC-LEVEL2 NOT LESS THAN '1' AND
01502                    JW-ATC-LEVEL2 NOT GREATER THAN '9'
01503                                 GO TO CHECK-2BC-AGAIN.
01504 **    09       GO TO READ-JW-FILE.
01505            CHECK-2BC-AGAIN.
01506       15       MOVE JW-BUREAU-NUMBER TO TEST-2BC-BN.
01507       16       MOVE JW-JCN TO TEST-2BC-JCN.
01508                PERFORM SEARCH-2BC-RECORDS THRU SEARCH-END.
01509                IF SWT-2BC = 'N' NEXT SENTENCE
01510                             ELSE GO TO READ-JW-FILE.
01511            MOVE-JW-GENERIC.
01512                MOVE JW-WU-CODE TO GEN-WUC.
01513                MOVE JW-JCN TO GEN-JCN.
01514                MOVE JW-TE-CODE TO GEN-TE-CODE.
01515                MOVE JW-SERIAL-NUMBER TO GEN-SERIAL-NUMBER.
01516                MOVE JW-BUREAU-NUMBER TO GEN-BUREAU-NUMBER.
01517                MOVE JW-GENERIC TO REST-OF-GENERIC.
01518                GO TO SET-SWITCH2.
01519 **    09   TEST-NEWUC.
01520                PERFORM SEARCH-2A-LIST THRU SEARCH-2A-END.
01521                IF 2A-SWT = 'Y' GO TO READ-JBW2.
01522                IF NEWUC = ZERO GO TO READ-JBW2.
01523                MOVE 1 TO COUNT.
01524       12       MOVE ZERO TO SWITCH.
01525       14       MOVE J TO JJ.
01526                MOVE ZERO TO I.
01527                IF SWUC (J) IS LESS THAN FWUC (1) GO TO END-BINARY-SEARCH.
01528                IF SWUC (J) IS GREATER THAN FWUC (NEWUC)
01529                                        GO TO END-BINARY-SEARCH.
01530                MOVE 1 TO INDX1.
01531                MOVE NEWUC TO INDX3.
01532            CONT-TABUFR-BINARY-SEARCH.
01533                SUBTRACT INDX1 FROM INDX3 GIVING BIN-DIFF.
01534                IF BIN-DIFF = 1 GO TO TEST-TABUFR-TWO-CODES.
01535                ADD INDX3 TO INDX1 GIVING INDX2.
01536                ADD 1 TO INDX2.
01537                DIVIDE 2 INTO INDX2.
01538                IF SWUC (J) IS LESS THAN FWUC (INDX2) MOVE INDX2 TO INDX3
01539                                      GO TO CONT-TABUFR-BINARY-SEARCH.
```

```
                MOVE INDX2 TO INDX1.
                GO TO CONT-IABUFR-BINARY-SEARCH.
            TEST-IABUFR-TWO-CODES.
                IF SWUC (J) = FWUC (INDX1) MOVE INDX1 TO I.
                IF SWUC (J) = FWUC (INDX3) MOVE INDX3 TO I.
            END-BINARY-SEARCH.
                MOVE 1 TO IABUFR (I).
                MOVE ZERO TO I.
                PERFORM BUFFER-MOVE THRU BUFFER-END.
                PERFORM SEARCH-S-FILE THRU S-FILE-END.
                IF S-SWI = 'N' GO TO SET-I.
                PERFORM SBUFFER-MOVE THRU SBUFFER-END.
        18  SET-I.
**      01      ADD 1 TO I.
                IF I IS GREATER THAN NFWUC GO TO SET-TCOUNT.
                IF FWUC (I) = SWUC (J) GO TO SET-I.
                MOVE FWUC (I) TO GEN-JBW-KEY2-WUC.
                MOVE BUNOKEY TO GEN-JBW-KEY2-BN.
                START JBW-FILE KEY = GEN-JBW-KEY2 INVALID KEY GO TO SET-I.
        08  READ-AGAIN-JBW.
                READ JBW-FILE AT END GO TO SET-I.
        10      IF JBW-WU-CODE NOT = FWUC(I) GO TO SET-I.
        11      IF JBW-BUREAU-NUMBER NOT = BUNOKEY GO TO SET-I.
        12      IF JBW-ATC-LEVEL1 NOT = 'R' GO TO LATTER-CASE.
        13      IF JBW-ATC-LEVEL2 NOT = 'A' GO TO LATTER-CASE.
                IF SWITCH NOT = 1 GO TO SET-IJ.
                IF JBW-JCN-DATE IS NOT GREATER THAN JCNMAX-DATE
                                   GO TO SET-IJ.
        16  LATTER-CASE.
                IF JBW-ATC-LEVEL1 NOT = 'R' GO TO READ-AGAIN-JBW.
        18      IF JBW-ATC-LEVEL2 = 'B' GO TO END-LATTER-CASE.
        19      IF JBW-ATC-LEVEL2 = 'C' GO TO END-LATTER-CASE.
                IF JBW-ATC-LEVEL2 NOT LESS THAN '1' AND
                   JBW-ATC-LEVEL2 NOT GREATER THAN '9'
                                  GO TO END-LATTER-CASE.
**      05      GO TO READ-AGAIN-JBW.
        06  END-LATTER-CASE.
        07      IF SWITCH = ZERO MOVE 1 TO SWITCH
        08                       GO TO SET-JCNMAX.
                IF SWITCH = 1 AND JBW-JCN IS LESS THAN JCNMAX
        10                    GO TO SET-JCNMAX.
                GO TO SET-I.
        11  SET-IJ.
        12      MOVE ZERO TO IJ.
                IF FWUC (I) IS LESS THAN SWUC (1) GO TO ADD-TO-COUNT.
                IF FWUC (I) IS GREATER THAN SWUC (NSWUC) GO TO ADD-TO-COUNT.
                MOVE 1 TO INDX1.
                MOVE NSWUC TO INDX3.
            CONT-BINARY-SEARCH.
                SUBTRACT INDX1 FROM INDX3 GIVING BIN-DIFF.
                IF BIN-DIFF = 1 GO TO TEST-TWO-CODES.
                ADD INDX3 TO INDX1 GIVING INDX2.
                ADD 1 TO INDX2.
                DIVIDE 2 INTO INDX2.
                IF FWUC (I) IS LESS THAN SWUC (INDX2) MOVE INDX2 TO INDX3
                                    GO TO CONT-BINARY-SEARCH.
                MOVE INDX2 TO INDX1.
                GO TO CONT-BINARY-SEARCH.
            TEST-TWO-CODES.
                IF FWUC (I) = SWUC (INDX1) MOVE INDX1 TO IJ.
                IF FWUC (I) = SWUC (INDX3) MOVE INDX3 TO IJ.
            ADD-TO-COUNT.
                ADD 1 TO COUNT.
                MOVE 1 TO IABUFR (COUNT).
                PERFORM BUFFER-MOVE THRU BUFFER-END.
                PERFORM SEARCH-S-FILE THRU S-FILE-END.
                IF S-SWT = 'N' GO TO READ-AGAIN-JBW.
                PERFORM SBUFFER-MOVE THRU SBUFFER-END.
                GO TO READ-AGAIN-JBW.
        19  SET-JCNMAX.
                MOVE JBW-JCN TO JCNMAX.
                ADD 1 TO COUNT.
                MOVE COUNT TO SWI-COUNT.
                MOVE JBW-ML2-DATE TO ML2DTE (COUNT).
                MOVE JBW-JCN TO JCNO (COUNT).
                MOVE '1' TO JCNO-TAG (COUNT).
                MOVE 1 TO IABUFR (COUNT).
```

```
                   GO TO SET-1.
               SET-TCOUNT.
                   MOVE COUNT TO TCOUNT.
                   IF SWITCH = ZERO GO TO READ-JBW2.
                   IF JCNKEY-DATE IS GREATER THAN JCNMAX-DATE GO TO READ-JBW2.
 **      02        MOVE ZERO TO SWITCH.
         03        MOVE ZERO TO L.
         04        MOVE 1 TO SAVE-COUN2.
         06        MOVE 1 TO COUN2.
 **      05    SET-COUNT2-TAB.
         07        MOVE '0' TO JCNO-TAG(SAVE-COUN2).
                   MOVE 99999 TO MIN-POS-VALUE.
         09        ADD 1 TO L.
                   IF L IS GREATER THAN TCOUNT SUBTRACT 1 FROM L
                                              GO TO END-SEARCH-JCNO-1.
                   MOVE SAVE-COUN2 TO KOUNT2 (L).
         12        IF JCNO(SAVE-COUN2) = JCNMAX MOVE 1 TO SWITCH
                                                SUBTRACT 1 FROM L
                                         GO TO END-SEARCH-JCNO-1.
         14    SEARCH-JCNO-1.
         15        ADD 1 TO COUN2.
                   IF COUN2 IS GREATER THAN TCOUNT GO TO TEST-MIN-VALUE-1.
         17        IF JCNO-TAG(COUN2) = '0' GO TO SEARCH-JCNO-1.
                   MOVE ML2DTE (SAVE-COUN2) TO SUB-BUFFER-DATE1.
                   MOVE JCNO-DATE (COUN2) TO SUB-BUFFER-DATE2.
                   PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
                   IF DATE-DIFF IS GREATER THAN 2 GO TO SEARCH-JCNO-1.
                   MOVE IABUFR (COUN2) TO MATRIX-NOM-KEY.
                   MOVE JABUFR (SAVE-COUN2) TO MATRIX-IDX.
                   READ MATRIX-FILE INVALID KEY GO TO SEARCH-JCNO-1.
                   IF MATRIX-VAL (MATRIX-IDX) NOT = 1 GO TO SEARCH-JCNO-1.
                   IF JCNO (COUN2) = JCNMAX GO TO JCNO-1-NUM.
                   IF JABUFR (COUN2) NOT = ZERO NEXT SENTENCE
                                     ELSE MOVE '0' TO JCNO-TAG (COUN2)
                                          GO TO SEARCH-JCNO-1.
               JCNO-1-NUM.
                   MOVE JCNO-DATE (SAVE-COUN2) TO SUB-BUFFER-DATE1.
                   MOVE JCNO-DATE (COUN2) TO SUB-BUFFER-DATE2.
                   PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
                   IF DATE-DIFF IS LESS THAN MIN-POS-VALUE AND
                      DATE-DIFF IS NOT LESS THAN ZERO
                                                  MOVE COUN2 TO REM-COUN2
                                   MOVE DATE-DIFF TO MIN-POS-VALUE.
 **      01        GO TO SEARCH-JCNO-1.
         02    TEST-MIN-VALUE-1.
                   IF MIN-POS-VALUE = 99999 GO TO END-SEARCH-JCNO-1.
         04        MOVE REM-COUN2 TO SAVE-COUN2.
                   MOVE ZERO TO COUN2.
         05        GO TO SET-COUNT2-TAB.
         06    END-SEARCH-JCNO-1.
         09        MOVE L TO L2.
                   IF SWITCH = 0 GO TO CORRECTIVE-TIE-IN.
               CHECK-L.
                   MOVE ZERO TO L.
         11        MOVE 1 TO PCOUNT.
         12        MOVE ZERO TO COUNT.
                   MOVE 99999 TO MIN-POS-VALUE.
         13    SEARCH-JCNO-2.
 **      13        ADD 1 TO COUNT.
                   IF COUNT IS GREATER THAN TCOUNT GO TO TEST-MIN-VALUE.
                   IF JCNO-TAG (COUNT) = '0' GO TO SEARCH-JCNO-2.
                   MOVE ML2DTE (COUNT) TO SUB-BUFFER-DATE1.
                   MOVE JCNO-DATE (PCOUNT) TO SUB-BUFFER-DATE2.
                   PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
                   IF DATE-DIFF IS GREATER THAN 2 GO TO SEARCH-JCNO-2.
                   IF JABUFR (COUNT) = ZERO MOVE '0' TO JCNO-TAG (COUNT)
                                            GO TO SEARCH-JCNO-2.
                   MOVE IABUFR (PCOUNT) TO MATRIX-NOM-KEY.
                   MOVE JABUFR (COUNT) TO MATRIX-IDX.
                   READ MATRIX-FILE INVALID KEY GO TO SEARCH-JCNO-2.
                   IF MATRIX-VAL (MATRIX-IDX) NOT = 1 GO TO SEARCH-JCNO-2.
               JCNO-2-NUM.
                   MOVE JCNO-DATE (COUNT) TO SUB-BUFFER-DATE1.
                   MOVE JCNO-DATE (PCOUNT) TO SUB-BUFFER-DATE2.
                   PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
                   IF DATE-DIFF IS NOT GREATER THAN MIN-POS-VALUE AND
                      DATE-DIFF IS NOT LESS THAN ZERO
```

```
01694                                   MOVE COUNT TO REM-COUNT
01695                                   MOVE DATE-DIFF TO MIN-POS-VALUE.
01696                  GO TO SEARCH-JCNO-2.
01697              TEST-MIN-VALUE.
01698                  IF MIN-POS-VALUE = 99999 GO TO END-SEARCH-JCNO-2.
01699                  MOVE '0' TO JCNO-TAG (REM-COUNT).
01700 **    02         ADD 1 TO L.
01701                  MOVE REM-COUNT TO KOUNT1 (L).
01702       04         MOVE REM-COUNT TO PCOUNT.
01703                  MOVE 99999 TO MIN-POS-VALUE.
01704                  MOVE 1 TO COUNT.
01705                  IF I IS LESS THAN TCOUNT GO TO SEARCH-JCNO-2.
01706       09     END-SEARCH-JCNO-2.
01707                  PERFORM FIX-JCNO-TAG THRU FIX-END.
01708       10         MOVE L TO L1.
01709                  MOVE SPACE TO PRINT-LINE.
01710       11         IF L1 = ZERO GO TO SET-FOR-LOOP2.
01711       12         MOVE ZERO TO L.
01712                  IF JABUFR (COUNT) NOT = ZERO MOVE BUNOKEY TO BUREAU-NUMBER-2A
01713                                               MOVE JCNO (COUNT) TO JCN-2A
01714                                               WRITE 2A-RECORD INVALID KEY
01715                             MOVE 10 TO ERR-IDX
01716                             PERFORM ERR-RTN THRU ERR-EXIT.
01717       13     LOOP-FILL-STABLE-1.
01718       14         ADD 1 TO L
01719                  IF L IS GREATER THAN L1 GO TO SET-FOR-LOOP2.
01720 **    01         SUBTRACT L FROM L1 GIVING L-IDX.
01721       02         ADD 1 TO L-IDX.
01722                  MOVE KOUNT1 (L-IDX) TO COUNT.
01723       04         MOVE JABUFR(COUNT) TO IJ.
01724       05         IF IJ = ZERO GO TO L1-SET-IJ.
01725       06         ADD 1 TO A2ACT(IJ).
01726                  ADD ABUFMH (COUNT) TO A2MMH (IJ).
01727                  ADD ABUFMU (COUNT) TO A2MU (IJ).
01728       09         ADD ABUFS(COUNT) TO A2S(IJ).
01729       10         ADD ABUFAWM(COUNT) TO A2AWM(IJ).
01730       11     L1-SET-IJ.
01731 **    11         MOVE JSBUFR(COUNT) TO IJ.
01732       12         IF IJ = ZERO GO TO LOOP-FILL-STABLE-1.
01733       13         ADD 1 TO SACT(IJ).
01734                  ADD SBUFMU (COUNT) TO SMU (IJ).
01735                  ADD SBUFMH (COUNT) TO SMMH (IJ).
01736       16         ADD SBUFS(COUNT) TO SS(IJ).
01737       17         ADD SBUFAWM(COUNT) TO SAWM(IJ).
01738       18         GO TO LOOP-FILL-STABLE-1.
01739       19     SET-FOR-LOOP2.
01740       20         MOVE ZERO TO L.
01741              LOOP-FILL-STABLE-2.
01742                  ADD 1 TO L.
01743                  IF L IS GREATER THAN L2 GO TO FIRST-CHRONO-SWUC.
01744                  MOVE KOUNT2 (L) TO COUNT.
01745                  IF JABUFR (COUNT) NOT = ZERO MOVE BUNOKEY TO BUREAU-NUMBER-2A
01746                                               MOVE JCNO (COUNT) TO JCN-2A
01747                                               WRITE 2A-RECORD INVALID KEY
01748                             MOVE 10 TO ERR-IDX
01749                             PERFORM ERR-RTN THRU ERR-EXIT.
01750 **    01         MOVE JABUFR(COUNT) TO IJ.
01751       02         IF IJ = ZERO GO TO L2-SET-IJ.
01752       03         ADD 1 TO A2ACT(IJ).
01753                  ADD ABUFMH (COUNT) TO A2MMH (IJ).
01754                  ADD ABUFMU (COUNT) TO A2MU (IJ).
01755                  ADD ABUFAWM (COUNT) TO A2AWM (IJ).
01756       06         ADD ABUFS(COUNT) TO A2S(IJ).
01757       08     L2-SET-IJ.
01758                  MOVE JSBUFR (COUNT) TO IJ.
01759       10         IF IJ = ZERO GO TO LOOP-FILL-STABLE-2.
01760       11         ADD 1 TO SACT(IJ).
01761                  ADD SBUFMH (COUNT) TO SMMH (IJ).
01762                  ADD SBUFMU (COUNT) TO SMU (IJ).
01763                  ADD SBUFAWM (COUNT) TO SAWM (IJ).
01764                  ADD SBUFS (COUNT) TO SS (IJ).
01765                  GO TO LOOP-FILL-STABLE-2.
01766              FIRST-CHRONO-SWUC.
01767                  IF L1 = ZERO MOVE 1 TO FIRST1
01768                               ELSE MOVE KOUNT1 (L1) TO FIRST1.
01769                  IF IABUFR (FIRST1) = ZERO GO TO END-READ-JBW-LOOP.
01770                  MOVE IABUFR (FIRST1) TO MATRIX-NOM-KEY.
```

```
            READ MATRIX-FILE INVALID KEY GO TO END-READ-JBW-LOOP.
            MOVE ZERO TO IJ.
            MOVE 1 TO I.
        LOOP-ON-IJ.
            ADD 1 TO IJ.
            IF IJ IS GREATER THAN NSWUC GO TO END-READ-JBW-LOOP.
   /        IF I IS GREATER THAN NFWUC GO TO LOOP-MOVE-TO-GEN.
            IF SWUC (IJ) = FWUC (I) ADD 1 TO I
                                     GO TO LOOP-ON-IJ.
            IF SWUC (IJ) IS GREATER THAN FWUC (I) ADD 1 TO I
                                                  SUBTRACT 1 FROM IJ
                                                  GO TO LOOP-ON-IJ.
        LOOP-MOVE-TO-GEN.
            MOVE SWUC (IJ) TO GEN-JBW-KEY2-WUC.
            MOVE BUNOKEY TO GEN-JBW-KEY2-BN.
            START JBW-FILE KEY = GEN-JBW-KEY2 INVALID KEY
                                             GO TO LOOP-ON-IJ.
        READ-JBW-ON-LOOP.
            READ JBW-FILE AT END GO TO END-READ-JBW-LOOP.
            IF JBW-WU-CODE NOT = SWUC (IJ) GO TO LOOP-ON-IJ.
            IF JBW-BUREAU-NUMBER NOT = BUNOKEY GO TO LOOP-ON-IJ.
            IF JBW-ATC-LEVEL1 NOT = 'R' GO TO READ-JBW-ON-LOOP.
            IF JBW-ATC-LEVEL2 NOT = 'A' GO TO READ-JBW-ON-LOOP.
            PERFORM SEARCH-2A-LIST THRU SEARCH-2A-END.
            IF 2A-SWT = 'Y' GO TO READ-JBW-ON-LOOP.
            MOVE IJ TO MATRIX-IDX.
            IF MATRIX-VAL (MATRIX-IDX) NOT = 1 GO TO READ-JBW-ON-LOOP.
            MOVE JBW-ML1-DATE TO SUB-BUFFER-DATE1.
            MOVE JCNO-DATE (FIRST1) TO SUB-BUFFER-DATE2.
            PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
            IF DATE-DIFF IS GREATER THAN 2 GO TO READ-JBW-ON-LOOP.
            ADD 1 TO A2ACT (IJ).
            ADD JBW-MMH-LEVEL1 TO A2MMH (IJ).
            ADD JBW-MMH-LEVEL2 TO A2MMH (IJ).
            ADD JBW-NORMU-TIME TO A2MU (IJ):
            ADD JBW-NORS-TIME TO A2S (IJ).
            ADD JBW-AWM-TIME TO A2AWM (IJ).
        END-READ-JBW-LOOP.
            GO TO READ-JBW2.
   20   END-JOB.
            CLOSE JBW-FILE
                  JSW-FILE
                  JW-FILE
                  S-FILE
                  2BC-LIST-FILE
                  2A-LIST-FILE
                  PRINT-FILE
                        MATRIX-FILE
                     INPUT-CARD-FILE1.
            STOP RUN.
 *
***
        FIX-JCNO-TAG.
            MOVE ZERO TO JCNO-IDX.
        INCR-JCNO-IDX.
            ADD 1 TO JCNO-IDX.
            IF JCNO-IDX IS GREATER THAN ICOUNT GO TO FIX-END.
            MOVE '1' TO JCNO-TAG (JCNO-IDX).
            GO TO INCR-JCNO-IDX.
        FIX-END.
            EXIT.
        CORRECTIVE-TIE-IN.
            MOVE 1 TO K.
        INCR-K.
            ADD 1 TO K.
            IF K IS GREATER THAN L2 PERFORM FIX-JCNO-TAG
                                    THRU FIX-END
                                    GO TO READ-JBW2.
            SUBTRACT K FROM L2 GIVING K2.
            ADD 1 TO K2.
            MOVE KOUNT2 (K2) TO SAVE-COUN2.
            MOVE ML2DIF (SAVE-COUN2) TO SUB-BUFFER-DATE1.
            MOVE JCNO-DATE (SWT-COUNT) TO SUB-BUFFER-DATE2.
            PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
            IF DATE-DIFF IS GREATER THAN 2 GO TO INCR-K.
            MOVE IABUFR (SWT-COUNT) TO MATRIX-NOM-KEY.
            MOVE JABUFR (SAVE-COUN2) TO MATRIX-IDX.
```

```
                 READ MATRIX-FILE INVALID KEY GO TO INCR-K.
                 IF MATRIX-VAL (MATRIX-IDX) NOT = 1 GO TO INCR-K.
                 MOVE 1 TO SWITCH.
                 ADD 1 TO K2 GIVING L2.
                 MOVE SWT-COUNT TO KOUNT2 (L2).
                 GO TO CHECK-L.
             BUFFER-MOVE.
                 MOVE JBW-NORMU-TIME TO ABUFMU (COUNT).
                 MOVE JBW-NORS-TIME TO ABUFS (COUNT).
                 MOVE JBW-AWM-TIME TO ABUFAWM (COUNT).
                 MOVE JBW-MMH-LEVEL1 TO ABUFMH (COUNT).
                 ADD JBW-MMH-LEVEL2 TO ABUFMH (COUNT).
                 MOVE IJ TO JABUFR(COUNT).
 **    01        MOVE ZERO TO SBUFMU(COUNT).
       02        MOVE ZERO TO SBUFS(COUNT).
       03        MOVE ZERO TO SBUFAWM(COUNT).
       04        MOVE ZERO TO SBUFMH(COUNT).
       05        MOVE ZERO TO JSBUFR(COUNT).
                 MOVE JBW-MI2-DATE TO ML2DTE (COUNT).
                 MOVE JBW-JCN TO JCNO (COUNT).
                 MOVE '1' TO JCNO-TAG (COUNT).
             BUFFER-END.
                 EXIT.
             SBUFFER-MOVE.
       13        MOVE S-INDEX TO JSBUFR(COUNT).
       14        MOVE S-MMH-VALUE TO SBUFMH(COUNT).
        /        MOVE S-MU-VALUE TO SBUFMU (COUNT).
       16        MOVE S-S-VALUE TO SBUFS(COUNT).
                 MOVE S-AWM-VALUE TO SBUFAWM (COUNT).
             SBUFFER-END.
                 EXIT.
  *
 **    01    SEARCH-2BC-RECORDS.
                 MOVE 'N' TO SWT-2BC.
                 MOVE TEST-2BC-BN TO 2BC-NOM-BN.
                 MOVE TEST-2BC-JCN TO 2BC-NOM-JCN.
                 READ 2BC-LIST-FILE INVALID KEY GO TO SEARCH-END.
                 MOVE 'Y' TO SWT-2BC.
       11    SEARCH-END.
       12        EXIT.
  *    19
             SEARCH-2A-LIST.
                 MOVE 'N' TO 2A-SWT.
                 MOVE JBW-BUREAU-NUMBER TO 2A-NOM-BN.
                 MOVE JBW-JCN TO 2A-NOM-JCN.
                 READ 2A-LIST-FILE INVALID KEY GO TO SEARCH-2A-END.
                 MOVE 'Y' TO 2A-SWT.
             SEARCH-2A-END.
                 EXIT.
             DATE-DIFF-RTN.
                 SUBTRACT SUB-BUFFER-DATE1 FROM SUB-BUFFER-DATE2
                                             GIVING DATE-DIFF.
                 SUBTRACT BUFFER-DATE1-YR FROM BUFFER-DATE2-YR
                                             GIVING YR-DIFF.
                 IF YR-DIFF IS NOT GREATER THAN ZERO
                                             GO TO DATE-DIFF-END.
                 DIVIDE BUFFER-DATE1-YR BY 4
                                             GIVING INTEGER-YR.
                 MULTIPLY 4 BY INTEGER-YR.
                 IF INTEGER-YR = BUFFER-DATE1-YR
                                   SUBTRACT 634 FROM DATE-DIFF
                                   ELSE SUBTRACT 635 FROM DATE-DIFF.
             DATE-DIFF-END.
                 EXIT.
 **    01    COST-RTN.
       02        MOVE ZERO TO J.
       03        MOVE 1 TO L-IDX.
       04        MOVE SWUC(1) TO PREV-SWUC-DIGIT4.
       05    CONT-COST-RTN.
       06        ADD 1 TO J.
                 IF J IS GREATER THAN NSWUC GO TO COST-RTN-END.
       08        MOVE SWUC(J) TO SWUC-DIGIT4.
       09        IF SWUC-DIGIT4 NOT = PREV-SWUC-DIGIT4 ADD 1 TO L-IDX
       10                                              MOVE SWUC-DIGIT4 TO
       11                                                   PREV-SWUC-DIGIT4.
                 MULTIPLY 0.1 BY A1MMH (J).
                 MULTIPLY 0.1 BY A2MMH (J).
```

```
                    MULTIPLY 0.1 BY SMMH (J).
                    MULTIPLY 0.1 BY CMMH (J).
                    MULTIPLY 0.1 BY DMMH (J).
           13       MULTIPLY A1MMH(J) BY LCOST(L-IDX) GIVING A1LCST(J).
           14       MULTIPLY A2MMH(J) BY LCOST(L-IDX) GIVING A2LCST(J).
           15       MULTIPLY SMMH(J) BY LCOST(L-IDX) GIVING SLCOST(J).
           16       MULTIPLY CMMH(J) BY LCOST(L-IDX) GIVING CLCOST(J).
                    MULTIPLY DMMH (J) BY LCOST (L-IDX) GIVING DLCST (J).
           17       MULTIPLY CACT(J) BY MCOST(L-IDX) GIVING CMCOST(J).
                    MULTIPLY DACT (J) BY MCOST (L-IDX) GIVING DMCST (J).
           20       MULTIPLY DEPOT(J) BY DLCOST(L-IDX) GIVING DEPLCST(J).
                    MULTIPLY DEPOT(J) BY DMCOST(L-IDX) GIVING DEPMCST(J).
                    MULTIPLY DEPOT(J) BY DTCOST(L-IDX) GIVING DEPTCST(J).
                    MULTIPLY ATTRIT(J) BY ATCOST(L-IDX) GIVING ATRCST(J).
                    GO TO CONT-COST-RTN.
       **  01   COST-RTN-END.
           02       EXIT.
        *  03
        *  04
        *  05
        *  06
        *  07
                PRINT-RTN.
                    MOVE ZERO TO J.
                    PERFORM ZERO-TOTAL-COSTS THRU ZERO-END.
                HEADING-1-RTN.
                    WRITE PRINT-RECORD FROM HEADING-1 AFTER POSITIONING 0 LINES.
                    WRITE PRINT-RECORD FROM HEADING-2 AFTER POSITIONING 2 LINES.
                    WRITE PRINT-RECORD FROM HEADING-3 AFTER POSITIONING 1 LINES.
                    MOVE 4 TO LINE-COUNT.
                INCR-J1.
                    ADD 1 TO J.
                    IF J IS GREATER THAN NSWUC GO TO END-J1.
                    MOVE SWUC (J) TO D1-WUC.
                    MOVE A1ACT (J) TO D1-ACT.
                    MOVE A1MMH (J) TO D1-MMH.
                    MULTIPLY 0.1 BY A1MU (J).
                    MOVE A1MU (J) TO D1-NORMU.
                    MULTIPLY 0.1 BY A1S (J).
                    MULTIPLY 0.1 BY A1AWM (J).
                    MOVE A1S (J) TO D1-NORS.
                    MOVE A1AWM (J) TO D1-AWM.
                    MOVE A1LCST (J) TO D1-LABOR.
                    ADD A1ACT (J) TO TOTACT-1.
                    ADD A1MMH (J) TO TOTMMH-1.
                    ADD A1MU (J) TO TOTMU-1.
                    ADD A1S (J) TO TOTS-1.
                    ADD A1AWM (J) TO TOTAWM-1.
                    ADD A1LCST (J) TO TOTLCST-1.
                    IF LINE-COUNT IS GREATER THAN 56 PERFORM HEADING-1-RTN.
                    WRITE PRINT-RECORD FROM DETAIL-LINE-1 AFTER POSITIONING
                                                                  2 LINES.
                    ADD 2 TO LINE-COUNT.
                    GO TO INCR-J1.
                END-J1.
                    MOVE 'TOTAL' TO D1-WUC.
                    MOVE TOTACT-1 TO D1-ACT.
                    MOVE TOTMMH-1 TO D1-MMH.
                    MOVE TOTMU-1 TO D1-NORMU.
                    MOVE TOTS-1 TO D1-NORS.
                    MOVE TOTAWM-1 TO D1-AWM.
                    MOVE TOTLCST-1 TO D1-LABOR.
                    WRITE PRINT-RECORD FROM DETAIL-LINE-1 AFTER POSITIONING
                                                                  2 LINES.
                    PERFORM ZERO-TOTAL-COSTS THRU ZERO-END.
                    MOVE ZERO TO J.
                HEADING-2-RTN.
                    WRITE PRINT-RECORD FROM HEADING-4 AFTER POSITIONING 0 LINES.
                    WRITE PRINT-RECORD FROM HEADING-5 AFTER POSITIONING 2 LINES.
                    WRITE PRINT-RECORD FROM HEADING-6 AFTER POSITIONING 2 LINES.
                    WRITE PRINT-RECORD FROM HEADING-7 AFTER POSITIONING 1 LINES.
                    WRITE PRINT-RECORD FROM HEADING-8 AFTER POSITIONING 1 LINES.
                    MOVE 6 TO LINE-COUNT.
                INCR-J2.
                    ADD 1 TO J.
                    IF J IS GREATER THAN NSWUC GO TO END-J2.
                    MOVE SWUC (J) TO D2-WUC.
```

```
               MOVE A2ACT (J) TO D2-FACT.
               MOVE A2MMH (J) TO D2-FMMH.
               MULTIPLY 0.1 BY A2MU (J).
               MOVE A2MU (J) TO D2-FNORMU.
               MULTIPLY 0.1 BY A2S (J).
               MOVE A2S (J) TO D2-FNORS.
               MULTIPLY 0.1 BY A2AWM (J).
               MOVE A2AWM (J) TO D2-FAWM.
               MOVE A2LCST (J) TO D2-FLABOR.
               MOVE SACT (J) TO D2-AACT.
               MOVE SMMH (J) TO D2-AMMH.
               MULTIPLY 0.1 BY SMU (J).
               MOVE SMU (J) TO D2-ANORMU.
               MULTIPLY 0.1 BY SS (J).
               MOVE SS (J) TO D2-ANORS.
               MULTIPLY 0.1 BY SAWM (J).
               MOVE SAWM (J) TO D2-AAWM.
               MOVE SLCOST (J) TO D2-ALABOR.
               ADD A2ACT (J) TO TOTACT-1.
               ADD A2MMH (J) TO TOTMMH-1.
               ADD A2MU (J) TO TOTMU-1.
               ADD A2S (J) TO TOTS-1.
               ADD A2AWM (J) TO TOTAWM-1.
               ADD A2LCST (J) TO TOTLCST-1.
               ADD SACT (J) TO TOTACT-2.
               ADD SMMH (J) TO TOTMMH-2.
               ADD SMU (J) TO TOTMU-2.
               ADD SS (J) TO TOTS-2.
               ADD SAWM (J) TO TOTAWM-2.
               ADD SLCOST (J) TO TOTLCST-2.
               IF LINE-COUNT IS GREATER THAN 56 PERFORM HEADING-2-RTN.
               WRITE PRINT-RECORD FROM DETAIL-LINE-2 AFTER POSITIONING
                                                           2 LINES.
               ADD 2 TO LINE-COUNT.
               GO TO INCR-J2.
           END-J2.
               MOVE 'TOTAL' TO D2-WUC.
               MOVE TOTACT-1 TO D2-FACT.
               MOVE TOTMMH-1 TO D2-FMMH.
               MOVE TOTMU-1 TO D2-FNORMU.
               MOVE TOTS-1 TO D2-FNORS.
               MOVE TOTAWM-1 TO D2-FAWM.
               MOVE TOTLCST-1 TO D2-FLABOR.
               MOVE TOTACT-2 TO D2-AACT.
               MOVE TOTMMH-2 TO D2-AMMH.
               MOVE TOTMU-2 TO D2-ANORMU.
               MOVE TOTS-2 TO D2-ANORS.
               MOVE TOTAWM-2 TO D2-AAWM.
               MOVE TOTLCST-2 TO D2-ALABOR
               WRITE PRINT-RECORD FROM DETAIL-LINE-2 AFTER POSITIONING
                                                           2 LINES.
               PERFORM ZERO-TOTAL-COSTS THRU ZERO-END.
               MOVE ZERO TO J.
           HEADING-3-RTN.
               WRITE PRINT-RECORD FROM HEADING-9 AFTER POSITIONING 0 LINES.
               WRITE PRINT-RECORD FROM HEADING-10 AFTER POSITIONING
                                                        2 LINES.
               WRITE PRINT-RECORD FROM HEADING-11 AFTER POSITIONING
                                                        1 LINES.
               MOVE 4 TO LINE-COUNT.
           INCR-J3.
               ADD 1 TO J.
               IF J IS GREATER THAN NSWUC GO TO END-J3.
               MOVE SWUC (J) TO D3-WUC.
               MOVE CACT (J) TO D3-ACT.
               MOVE CMMH (J) TO D3-MMH.
               MULTIPLY 0.1 BY CMU (J).
               MOVE CMU (J) TO D3-NORMU.
               MULTIPLY 0.1 BY CS (J).
               MOVE CS (J) TO D3-NORS.
               MULTIPLY 0.1 BY CAWM (J).
               MOVE CAWM (J) TO D3-AWM.
               MOVE CLCOST (J) TO D3-LABOR
               MOVE CMCOST (J) TO D3-MATERIAL.
               ADD CACT (J) TO TOTACT-1.
               ADD CMMH (J) TO TOTMMH-1.
               ADD CMU (J) TO TOTMU-1.
           ADD CS (J) TO TOTS-1.
           ADD CAWM (J) TO TOTAWM-1.
           ADD CLCOST (J) TO TOTLCST-1.
           ADD CMCOST (J) TO TOTMCOST.
           IF LINE-COUNT IS GREATER THAN 56 PERFORM HEADING-3-RTN.
           IF LINE-COUNT   56 PERFORM HEADING-3-RTN.
           WRITE PRINT-RECORD FROM DETAIL-LINE-3 AFTER POSITIONING
                                                         2 LINES.
           ADD 2 TO LINE-COUNT.
           GO TO INCR-J3.
       END-J3.
           MOVE 'TOTAL' TO D3-WUC.
           MOVE TOTACT-1 TO D3-ACT.
           MOVE TOTMMH-1 TO D3-MMH.
           MOVE TOTMU-1 TO D3-NORMU.
           MOVE TOTS-1 TO D3-NORS.
           MOVE TOTAWM-1 TO D3-AWM.
           MOVE TOTLCST-1 TO D3-LABOR.
           MOVE TOTMCOST TO D3-MATERIAL.
           WRITE PRINT-RECORD FROM DETAIL-LINE-3 AFTER POSITIONING
                                                         2 LINES.
           PERFORM ZERO-TOTAL-COSTS THRU ZERO-END.
           MOVE ZERO TO J.
       HEADING-4-RTN.
           WRITE PRINT-RECORD FROM HEADING-12 AFTER POSITIONING
                                                    0 LINES.
           WRITE PRINT-RECORD FROM HEADING-13 AFTER POSITIONING
                                                    2 LINES.
           WRITE PRINT-RECORD FROM HEADING-14 AFTER POSITIONING
                                                    1 LINES.
           WRITE PRINT-RECORD FROM HEADING-15 AFTER POSITIONING
                                                     1 LINES.
           MOVE 5 TO LINE-COUNT.
       INCR-J4.
           ADD 1 TO J.
           IF J IS GREATER THAN NSWUC GO TO END-J4.
           MOVE SWUC (J) TO D4-WUC.
           MOVE DACT (J) TO D4-ACT.
           MOVE DMMH (J) TO D4-MMH.
           MULTIPLY 0.1 BY DMU (J).
           MOVE DMU (J) TO D4-NORMU.
           MULTIPLY 0.1 BY DS (J).
           MOVE DS (J) TO D4-NORS.
           MULTIPLY 0.1 BY DAWM (J).
           MOVE DAWM (J) TO D4-AWM.
           MOVE DLCST (J) TO D4-OI-LABOR.
           MOVE DMCST (J) TO D4-OI-MATERIAL.
           MOVE DEPLCST (J) TO D4-LABOR.
           MOVE DEPMCST (J) TO D4-MATERIAL.
           MOVE DEPTCST (J) TO D4-TRANSPORT.
           MOVE ATRCST (J) TO D4-DISCARD.
           ADD DACT (J) TO TOTACT-1.
           ADD DMMH (J) TO TOTMMH-1.
           ADD DMU (J) TO TOTMU-1.
           ADD DS (J) TO TOTS-1.
           ADD DAWM (J) TO TOTAWM-1.
           ADD DLCST (J) TO TOTLCST-1.
           ADD DMCST (J) TO TOTMCOST.
           ADD DEPLCST (J) TO TOTDLCST.
           ADD DEPMCST (J) TO TOTDMCST.
           ADD DEPTCST (J) TO TOTDTCST.
           ADD ATRCST (J) TO TOTACST.
           IF LINE-COUNT IS GREATER THAN 56 PERFORM HEADING-4-RTN.
           WRITE PRINT-RECORD FROM DETAIL-LINE-4 AFTER POSITIONING
                                                         2 LINES.
           ADD 2 TO LINE-COUNT
           GO TO INCR-J4.
       END-J4.
           MOVE 'TOTAL' TO D4-WUC.
           MOVE TOTACT-1 TO D4-ACT.
           MOVE TOTMMH-1 TO D4-MMH.
           MOVE TOTMU-1 TO D4-NORMU.
           MOVE TOTS-1 TO D4-NORS.
           MOVE TOTAWM-1 TO D4-AWM.
           MOVE TOTLCST-1 TO D4-OI-LABOR.
           MOVE TOTMCOST TO D4-OI-MATERIAL.
           MOVE TOTDLCST TO D4-LABOR.
```

```
02156                MOVE TOTDMCST TO D4-MATERIAL.
02157                MOVE TOTDTCST TO D4-TRANSPORT.
02158                MOVE TOTACST TO D4-DISCARD.
02159                WRITE PRINT-RECORD FROM DETAIL-LINE-4 AFTER POSITIONING
02160                                                            2 LINES.
02161            PRINT-RTN-END.
02162                EXIT.
02163 **     01  ERR-RTN.
02164                WRITE PRINT-RECORD FROM ERR-MSG (ERR-IDX) AFTER POSITIONING
02165                                                                2 LINES.
02166            ERR-EXIT.
02167        04      EXIT.
02168            SEARCH-S-FILE.
02169                MOVE BUNDKEY TO S-NOM-BN.
02170                MOVE JBW-JCN TO S-NOM-JCN.
02171                READ S-FILE INVALID KEY
02172                            MOVE 'N' TO S-SWT
02173                            GO TO S-FILE-END.
02174                MOVE 'Y' TO S-SWT.
02175            S-FILE-END.
02176                EXIT.
02177    *
02178            ZERO-TOTAL-COSTS.
02179                MOVE ZERO TO TOTACT-1, TOTMMH-1, TOTMU-1, TOTS-1, TOTAWM-1
02180                             TOTLCST-1, TOTMCOST, TOTDLCST, TOTDMCST,
02181                             TOTDTCST, TOTACST, TOTMMH-2, TOTMU-2, TOTS-2,
02182                             TOTAWM-2, TOTLCST-2, TOTACT-2.
02183            ZERO-END.
02184                EXIT.
02185 ***
02186            CHECK-POINT.
02187                MOVE J TO SAVE-J.
02188                MOVE 1 TO J.
02189                OPEN OUTPUT RESTART-FILE.
02190            CHECK-PT-BEGIN.
02191                MOVE A1ACT (J) TO A1-RESTART-ACT.
02192                MOVE A1MMH (J) TO A1-RESTART-MMH.
02193                MOVE A1MU (J) TO A1-RESTART-MU.
02194                MOVE A1S (J) TO A1-RESTART-S.
02195                MOVE A1AWM (J) TO A1-RESTART-AWM.
02196                MOVE A2ACT (J) TO A2-RESTART-ACT.
02197                MOVE A2MMH (J) TO A2-RESTART-MMH.
02198                MOVE A2MU (J) TO A2-RESTART-MU.
02199                MOVE A2S (J) TO A2-RESTART-S.
02200                MOVE A2AWM (J) TO A2-RESTART-AWM.
02201                MOVE CACT (J) TO C-RESTART-ACT.
02202                MOVE CMMH (J) TO C-RESTART-MMH.
02203                MOVE CMU (J) TO C-RESTART-MU.
02204                MOVE CS (J) TO C-RESTART-S.
02205                MOVE CAWM (J) TO C-RESTART-AWM.
02206                MOVE DACT (J) TO D-RESTART-ACT.
02207                MOVE DMMH (J) TO D-RESTART-MMH.
02208                MOVE DMU (J) TO D-RESTART-MU.
02209                MOVE DS (J) TO D-RESTART-S.
02210                MOVE DAWM (J) TO D-RESTART-AWM.
02211                MOVE SACT (J) TO S-RESTART-ACT.
02212                MOVE SMMH (J) TO S-RESTART-MMH.
02213                MOVE SMU (J) TO S-RESTART-MU.
02214                MOVE SS (J) TO S-RESTART-S.
02215                MOVE SAWM (J) TO S-RESTART-AWM.
02216                MOVE DEPOT (J) TO DEP-RESTART.
02217                MOVE ATTRIT (J) TO ATT-RESTART.
02218                WRITE RESTART-RECORD INVALID KEY NEXT SENTENCE.
02219                ADD 1 TO J.
02220                IF J IS GREATER THAN NSWUC GO TO CHECK-PT-J.
02221                GO TO CHECK-PT-BEGIN.
02222            CHECK-PT-J.
02223                MOVE SAVE-J TO A1-RESTART-ACT.
02224                WRITE RESTART-RECORD INVALID KEY NEXT SENTENCE.
02225                CLOSE RESTART-FILE.
02226            CHECK-POINT-END.
02227                EXIT.
02228 ***
02229            RESTART.
02230                OPEN INPUT RESTART-FILE.
02231                MOVE 1 TO J.
02232            RESTART-INCR-J.
```

```
           READ RESTART-FILE AT END MOVE 11 TO ERR-IDX
                                    PERFORM ERR-RTN THRU ERR-EXIT
                                    GO TO RESTART-READ-END.
           MOVE A1-RESTART-ACT TO A1ACT (J).
           MOVE A1-RESTART-MMH TO A1MMH (J).
           MOVE A1-RESTART-MU TO A1MU (J).
           MOVE A1-RESTART-S TO A1S (J).
           MOVE A1-RESTART-AWM TO A1AWM (J).
           MOVE A2-RESTART-ACT TO A2ACT (J).
           MOVE A2-RESTART-MMH TO A2MMH (J).
           MOVE A2-RESTART-MU TO A2MU (J).
           MOVE A2-RESTART-S TO A2S (J).
           MOVE A2-RESTART-AWM TO A2AWM (J).
           MOVE C-RESTART-ACT TO CACT (J).
           MOVE C-RESTART-MMH TO CMMH (J).
           MOVE C-RESTART-MU TO CMU (J).
           MOVE C-RESTART-S TO CS (J).
           MOVE C-RESTART-AWM TO CAWM (J).
           MOVE D-RESTART-ACT TO DACT (J).
           MOVE D-RESTART-MMH TO DMMH (J).
           MOVE D-RESTART-MU TO DMU (J).
           MOVE D-RESTART-S TO DS (J).
           MOVE D-RESTART-AWM TO DAWM (J).
           MOVE S-RESTART-ACT TO SACT (J).
           MOVE S-RESTART-MMH TO SMMH (J).
           MOVE S-RESTART-MU TO SMU (J).
           MOVE S-RESTART-S TO SS (J).
           MOVE S-RESTART-AWM TO SAWM (J).
           MOVE DEP-RESTART TO DEPOT (J).
           MOVE ATT-RESTART TO ATTRIT (J).
           ADD 1 TO J.
           IF J IS GREATER THAN NSWUC GO TO RESTART-J.
           GO TO RESTART-INCR-J.
       RESTART-J.
           READ RESTART-FILE AT END MOVE 11 TO ERR-IDX
                                    PERFORM ERR-RTN THRU ERR-EXIT
                                    GO TO RESTART-READ-END.
           MOVE A1-RESTART-ACT TO J.
           SUBTRACT 1 FROM J.
       RESTART-READ-END.
           CLOSE RESTART-FILE.
       RESTART-END.
           EXIT.
 ***
```

```
CBL SXREF,STATE,CLIST,FLOW
           IDENTIFICATION DIVISION.
           PROGRAM-ID.  KEYREO.
           AUTHOR.  TONY GIRGENTI , ISI.
           ENVIRONMENT DIVISION.
           CONFIGURATION SECTION.
           SOURCE-COMPUTER. IBM-370.
           OBJECT-COMPUTER. IBM-370.
           INPUT-OUTPUT SECTION.
           FILE-CONTROL.
               SELECT  KEYLIST-INP1 ASSIGN TO SYS031-DA-3340-I
                       ACCESS MODE IS SEQUENTIAL
                       RECORD KEY IS KEYLIST-KEY1.
               SELECT  KEYLIST-INP2 ASSIGN TO SYS032-DA-3340-I
                       ACCESS MODE IS SEQUENTIAL
                       RECORD KEY IS KEYLIST-KEY2.
               SELECT  KEYLIST-OUT1 ASSIGN TO SYS033-DA-3340-I
                       ACCESS MODE IS SEQUENTIAL
                       NOMINAL KEY IS NOMKEY1
                       RECORD KEY IS KEYLIST-KEY3.
               SELECT  KEYLIST-OUT2 ASSIGN TO SYS034-DA-3340-I
                       ACCESS MODE IS SEQUENTIAL
                       NOMINAL KEY IS NOMKEY2
                       RECORD KEY IS KEYLIST-KEY4.
               SELECT  IN-TAP1 ASSIGN TO SYS029-DA-3340-S
                       ACCESS MODE IS SEQUENTIAL.
               SELECT  IN-TAP2 ASSIGN TO SYS030-DA-3340-S
                       ACCESS MODE IS SEQUENTIAL.
           DATA DIVISION.
           FILE SECTION.
           FD  KEYLIST-INP1 LABEL RECORDS ARE STANDARD
                       RECORDING MODE IS F
                       BLOCK CONTAINS  500 RECORDS
                       RECORD CONTAINS 16  CHARACTERS.
           01  KEYLIST-REC1.
               02 KEYLIST-KEY1                     PIC X(16).
           FD  KEYLIST-INP2 LABEL RECORDS ARE STANDARD
                       RECORDING MODE IS F
                       BLOCK CONTAINS  500 RECORDS
                       RECORD CONTAINS 16  CHARACTERS.
           01  KEYLIST-REC2.
               02 KEYLIST-KEY2                     PIC X(16).
           FD  KEYLIST-OUT1 LABEL RECORDS ARE STANDARD
                       RECORDING MODE IS F
                       BLOCK CONTAINS  500 RECORDS
                       RECORD CONTAINS 16  CHARACTERS.
           01  KEYLIST-REC3.
               02 KEYLIST-KEY3                     PIC X(16).
           FD  KEYLIST-OUT2 LABEL RECORDS ARE STANDARD
                       RECORDING MODE IS F
                       BLOCK CONTAINS  500 RECORDS
                       RECORD CONTAINS 16  CHARACTERS.
           01  KEYLIST-REC4.
               02 KEYLIST-KEY4                     PIC X(16).
           FD  IN-TAP1 LABEL RECORDS ARE STANDARD
                       BLOCK CONTAINS  500 RECORDS
                       RECORD CONTAINS 16  CHARACTERS.
           01  IN-REC1.
               02  FILLER                          PIC X(16).
           FD  IN-TAP2 LABEL RECORDS ARE STANDARD
                       BLOCK CONTAINS  500 RECORDS
                       RECORD CONTAINS 16  CHARACTERS.
           01  IN-REC2.
               02  FILLER                          PIC X(16).
           WORKING-STORAGE SECTION.
           77  NOMKEY1                             PIC X(16).
           77  NOMKEY2                             PIC X(16).
           PROCEDURE DIVISION.
               OPEN INPUT KEYLIST-INP1.
               OPEN OUTPUT IN-TAP1.
               MOVE LOW-VALUE TO NOMKEY1, NOMKEY2,
                                 KEYLIST-KEY1, KEYLIST-KEY2.
           READ-KEYFILE1.
               READ KEYLIST-INP1 RECORD INTO IN-REC1
                         AT END CLOSE KEYLIST-INP1
                                CLOSE IN-TAP1
                                GO TO KEYFILE2-SAVE.
           WRITE IN-REC1.
                GO TO READ-KEYFILE1.
       KEYFILE2-SAVE.
           OPEN INPUT KEYLIST-INP2.
           OPEN OUTPUT IN-TAP2.
       READ-KEYFILE2.
           READ KEYLIST-INP2 RECORD INTO IN-REC2
                         AT END CLOSE KEYLIST-INP2
                                CLOSE IN-TAP2
                                GO TO RECREATE-KEY1.
           WRITE IN-REC2.
                GO TO READ-KEYFILE2.
       RECREATE-KEY1.
           OPEN INPUT IN-TAP1.
           OPEN OUTPUT KEYLIST-OUT1.
       READ-TAPE1.
           READ IN-TAP1 INTO KEYLIST-KEY3
                       AT END CLOSE KEYLIST-OUT1
                              CLOSE IN-TAP1
                              GO TO RECREATE-KEY2.
           WRITE KEYLIST-REC3 INVALID KEY
                     DISPLAY 'INVALID WRITE ON KEYLIST1-FILE = '
                              KEYLIST-KEY3 UPON SYSLST.
                GO TO READ-TAPE1.
       RECREATE-KEY2.
           OPEN INPUT IN-TAP2.
           OPEN OUTPUT KEYLIST-OUT2.
       READ-TAPE2.
           READ IN-TAP2 INTO KEYLIST-KEY4
                       AT END CLOSE KEYLIST-OUT2
                              CLOSE IN-TAP2
                              GO TO CLOSE-OUT.
           WRITE KEYLIST-REC4 INVALID KEY
                     DISPLAY 'INVALID WRITE ON KEYLIST2-FILE = '
                              KEYLIST-KEY4 UPON SYSLST.
                GO TO READ-TAPE2.
       CLOSE-OUT.
           STOP RUN.
```

```
CBL SXREF,CLIST,FLOW,STATE
              IDENTIFICATION DIVISION.
              PROGRAM-ID. PROG3C.
              AUTHOR. INFORMATION SPECTRUM.
              ENVIRONMENT DIVISION.
              CONFIGURATION SECTION.
              SOURCE-COMPUTER. IBM-370.
              OBJECT-COMPUTER. IBM-370.
              INPUT-OUTPUT SECTION.
              FILE-CONTROL.
                  SELECT JBW-FILE ASSIGN TO SYS030-DA-3340-I
                         ACCESS MODE IS SEQUENTIAL
                         NOMINAL KEY IS JBW-NOMINAL-KEY
                         RECORD KEY IS JBW-KEY.
                  SELECT JB-FILE ASSIGN TO SYS033-DA-3340-I
                         ACCESS MODE IS SEQUENTIAL
                         NOMINAL KEY IS JB-NOMINAL-KEY
                         RECORD KEY IS JB-KEY.
                  SELECT PRINT-FILE ASSIGN TO SYS008-UR-3203-S.
                  SELECT INPUT-CARD-FILEI ASSIGN TO SYS007-UR-1442R-S.
                  SELECT MATRIX-FILE ASSIGN TO SYS029-DA-3340-I
                         ACCESS MODE IS RANDOM
                         NOMINAL KEY IS MATRIX-NOMINAL-KEY
                         RECORD KEY IS MATRIX-KEY.
                  SELECT NC-LIST-FILE ASSIGN TO SYS028-DA-3340-I
                         ACCESS MODE IS RANDOM
                          NOMINAL KEY IS NC-NOM-KEY
                          RECORD KEY IS NC-REC-KEY.
                  SELECT PC-LIST-FILE ASSIGN TO SYS031-DA-3340-I
                         ACCESS MODE IS RANDOM
                          NOMINAL KEY IS PC-NOM-KEY
                          RECORD KEY IS PC-REC-KEY.
                  SELFCT RFSTART-FILE ASSIGN TO SYS027-DA-3340-S.
                  SELECT  KEYLIST-OUTI ASSIGN TO SYS015-DA-3340-I .
                          ACCESS MODE IS SEQUENTIAL
                          NOMINAL KEY IS NOMKEYI
                  RESERVF NO ALTERNATE AREAS
                          RECORD KEY IS KEYLIST-KEY3.
                  SELECT  KEYLIST-OUT2 ASSIGN TO SYS014-DA-3340-I
                          ACCESS MODE IS SEQUENTIAL
                          NOMINAL KEY IS NOMKEY2
                  RESERVE NO ALTERNATE AREAS
                          RECORD KEY IS KEYLIST-KEY4.
                  SELECT  IN-TAPI ASSIGN TO SYS016-DA-3340-S
                  RESERVE NO ALTERNATE AREAS
                          ACCESS MODE IS SEQUENTIAL.
                  SELECT  KEYLIST-INPI ASSIGN TO SYS019-DA-3340-I
                          ACCESS MODE IS SEQUENTIAL
                          RECORD KEY IS KEYLIST-KEYI.
                  SFLFCT  KEYLIST-INP2 ASSIGN TO SYS032-DA-3340-I
                          ACCESS MODE IS SEQUENTIAL
                          RECORD KEY IS KEYLIST-KEY2.
              I-O-CONTROL.
                  SAME AREA FOR NC-LIST-FILE KEYLIST-OUTI.
                  SAME AREA FOR PC-LIST-FILE KEYLIST-OUT2.
                  SAME AREA FOR KEYLIST-INPI KEYLIST-INP2.
              DATA DIVISION.
              FILE SECTION.
              FD  KEYLIST-INPI LABEL RECORDS ARE STANDARD
                         RECORDING MODE IS F
                         BLOCK CONTAINS  500 RECORDS
                         RECORD CONTAINS 16  CHARACTERS.
              01  KEYLIST-RECI.
                  02 KEYLIST-KEYI                 PIC X(16).
              FD  KEYLIST-INP2 LABEL RECORDS ARE STANDARD
                         RECORDING MODE IS F
                         BLOCK CONTAINS  500 RECORDS
                         RECORD CONTAINS 16, CHARACTERS.
              01  KEYLIST-REC2.
                  02 KEYLIST-KEY2                 PIC X(16).
              FD  KEYLIST-OUTI LABEL RECORDS ARE STANDARD
                         RECORDING MODE IS F
                         BLOCK CONTAINS  500 RECORDS
                         RECORD CONTAINS 16  CHARACTERS.
              01  KEYLIST-REC3.
                  02 KEYLIST-KEY3                 PIC X(16).
              FD  KEYLIST-OUT2 LABEL RECORDS ARE STANDARD
```

```
00077                       RECORDING MODE IS F
00078                       BLOCK CONTAINS  500 RECORDS
00079                       RECORD CONTAINS 16  CHARACTERS.
00080           01  KEYLIST-REC4.
00081               02 KEYLIST-KEY4              PIC X(16).
00082           FD  IN-TAPI LABEL RECORDS ARE STANDARD
00083                       BLOCK CONTAINS  500 RECORDS
00084                       RECORD CONTAINS 16  CHARACTERS.
00085           01  IN-REC1.
00086               02  FILLER                   PIC X(16).
00087           FD  RESTART-FILE LABEL RECORDS ARE STANDARD.
00088           01  RESTART-RECORD.
00089   M           02 DEPOT-TAB-O.
00090                   03 PCDPOT-O              PIC 9(6)V99.
00091                   03 PNCDPT-O              PIC 9(6)V99.
00092                   03 RDEPOT-O              PIC 9(6)V99.
00093                   03 NCDPOT-O              PIC 9(6)V99.
00094                   03 PCATRT-O              PIC 9(6)V99.
00095                   03 PNCATT-O              PIC 9(6)V99.
00096                   03 RATTRIT-O             PIC 9(6)V99.
00097                   03 NCATRT-O              PIC 9(6)V99.
00098               02 PC-TAB-O.
00099                   03 PCACT-O               PIC 9(3).
00100                   03 PCMMH-O               PIC 9(7)V9.
00101                   03 PCMU-O                PIC 9(7)V9.
00102                   03 PCS-O                 PIC 9(7)V9.
00103                   03 PCAWM-O               PIC 9(7)V9.
00104               02 PNC-TAB-O.
00105                   03 PNCACT-O              PIC 9(3).
00106                   03 PNCMMH-O              PIC 9(7)V9.
00107                   03 PNCMU-O               PIC 9(7)V9.
00108                   03 PNCS-O                PIC 9(7)V9.
00109                   03 PNCAWM-O              PIC 9(7)V9.
00110               02 NC-TAB-O.
00111                   03 NCACT-O               PIC 9(3).
00112                   03 NCMMH-O               PIC 9(7)V9.
00113                   03 NCMU-O                PIC 9(7)V9.
00114                   03 NCS-O                 PIC 9(7)V9.
00115                   03 NCAWM-O               PIC 9(7)V9.
00116               02 R-TAB-O.
00117                   03 RACT-O                PIC 9(3).
00118                   03 RMMH-O                PIC 9(7)V9.
00119                   03 RMU-O                 PIC 9(7)V9.
00120                   03 RS-O                  PIC 9(7)V9.
00121                   03 RAWM-O                PIC 9(7)V9.
00122           FD  INPUT-CARD-FILE1 LABEL RECORDS ARE OMITTED.
00123           01  INPUT-FILE-1-REC.
00124               02 FILLER                    PIC X(80).
00125           FD  PRINT-FILE LABEL RECORDS ARE OMITTED.
00126           01  PRINT-RECORD.
00127               02 PRINT-LINE                PIC X(132).
00128           FD  JBW-FILE LABEL RECORDS ARE STANDARD
00129 **-                 BLOCK CONTAINS 70 RECORDS.
00130           01  JBW-RECORD.
00131               02 JBW-KEY.
00132                   03 JBW-BN-WU.
00133                       04 JBW-WU-CODE       PIC X(5).
00134                       04 JBW-BUREAU-NUMBER     PIC 9(6).
00135                   03 JBW-JCN.
00136                       04 JBW-JCN-DATE          PIC 9(5).
00137                       04 JBW-JCN-SEQUENCE      PIC 9(3).
00138                       04 JBW-JCN-SUFFIX        PIC X(2).
00139               02 REST-OF-JBW.
00140                   03 FILLER                PIC X.
00141                   03 JBW-TE-CODE               PIC X(4).
00142                   03 FILLER                    PIC X.
00143                   03 JBW-SERIAL-NUMBER         PIC X(10).
00144                   03 FILLER                    PIC X.
00145                   03 JBW-ORG-CODE              PIC X(3).
00146                   03 FILLER                    PIC X.
00147                   03 JBW-ML1-DATE          PIC 9(5).
00148                   03 FILLER                    PIC X.
00149                   03 JBW-ML2-DATE          PIC 9(5).
00150                   03 FILLER                    PIC X.
00151                   03 JBW-ATC-LEVEL1            PIC X.
00152                   03 FILLER                    PIC X.
00153                   03 JBW-ATC-LEVEL2            PIC X.
```

```
        03 FILLER                           PIC X.
        03 JBW-HMC-LEVEL1                   PIC X(3).
        03 FILLER                           PIC X.
        03 JBW-HMC-LEVEL2                   PIC X(3).
        03 FILLER                           PIC X.
        03 JBW-METER-TIME                   PIC 9(4).
        03 FILLER                           PIC X.
        03 JBW-EMT-LEVEL1                   PIC 9(5).
        03 FILLER                           PIC X.
        03 JBW-EMT-LEVEL2                   PIC 9(5).
        03 FILLER                           PIC X.
        03 JBW-MMH-LEVEL1                   PIC 9(5).
        03 FILLER                           PIC X.
        03 JBW-MMH-LEVEL2                   PIC 9(5).
        03 FILLER                           PIC X.
        03 JBW-NORMU-TIME                   PIC 9(5).
        03 FILLER                           PIC X.
        03 JBW-NORS-TIME                    PIC 9(5).
        03 FILLER                           PIC X.
        03 JBW-AWM-TIME                     PIC 9(4).
FD  JB-FILE LABEL RECORDS ARE STANDARD
    BLOCK CONTAINS 70 RECORDS.
01  JB-RECORD.
    02 JB-KEY.
        03 JB-BUREAU-NUMBER         PIC 9(6).
        03 JB-JCN.
            04 JB-JCN-NUM.
                  05 JB-JCN-DATE        PIC 9(5).
                  05 JB-JCN-SEQUENCE    PIC 9(3).
            04 JB-JCN-SUFFIX        PIC X(2).
    02 REST-OF-JB.
        03 FILLER                   PIC X.
        03 JB-TE-CODE               PIC X(4).
        03 FILLER                   PIC X.
        03 JB-WU-CODE               PIC X(5).
        03 FILLER                   PIC X.
        03 JB-SERIAL-NUMBER         PIC X(10).
        03 FILLER                   PIC X.
        03 JB-ORG-CODE              PIC X(3).
        03 FILLER                   PIC X.
        03 JB-ML1-DATE              PIC 9(5).
        03 FILLER                   PIC X.
        03 JB-ML2-DATE              PIC 9(5).
        03 FILLER                   PIC X.
        03 JB-ATC-LEVEL1            PIC X.
        03 FILLER                   PIC X.
        03 JB-ATC-LEVEL2            PIC X.
        03 FILLER                   PIC X.
        03 JB-HMC-LEVEL1            PIC 9(3).
        03 FILLER                   PIC X.
        03 JB-HMC-LEVEL2            PIC 9(3).
        03 FILLER                   PIC X.
        03 JB-METER-TIME            PIC 9(4).
        03 FILLER                   PIC X.
        03 JB-EMT-LEVEL1            PIC 9(5).
        03 FILLER                   PIC X.
        03 JB-EMT-LEVEL2            PIC 9(5).
        03 FILLER                   PIC X.
        03 JB-MMH-LEVEL1            PIC 9(5).
        03 FILLER                   PIC X.
        03 JB-MMH-LEVEL2            PIC 9(5).
        03 FILLER                   PIC X.
        03 JB-NORMU-TIME            PIC 9(5).
        03 FILLER                   PIC X.
        03 JB-NORS-TIME             PIC 9(5).
        03 FILLER                   PIC X.
        03 JB-AWM-TIME              PIC 9(4).
FD  MATRIX-FILE LABEL RECORDS ARE STANDARD.
01  MATRIX-FILE-REC.
    02 MATRIX-KEY                   PIC 9(3).
    02 MATRIX-TAB OCCURS 300 TIMES.
        03 MATRIX-VAL               PIC X.
FD  NC-LIST-FILE      LABEL RECORDS ARE STANDARD
                      RECORDING MODE IS F
                      BLOCK CONTAINS 500 RECORDS
                      RECORD CONTAINS 16 CHARACTERS.
01  NC-RECORD.
```

```
          02  NC-REC-KEY.
              03  BUREAU-NUMBER-NC  PIC 9(6).
              03  JCN-NC.
                  04  JCN-DATE-NC  PIC 9(5).
                  04  JCN-SEQUENCE-NC  PIC 9(3).
                  04  JCN-SUFFIX-NC  PIC X(2).
      FD  PC-LIST-FILE  LABEL RECORDS ARE STANDARD
                        RECORDING MODE IS F
                        BLOCK CONTAINS 500 RECORDS
                        RECORD CONTAINS 16 CHARACTERS.
      01  PC-RECORD.
          02  PC-REC-KEY.
              03  BUREAU-NUMBFR-PC  PIC 9(6).
              03  JCN-PC.
                  04  JCN-DATE-PC  PIC 9(5).
                  04  JCN-SFQUENCE-PC  PIC 9(3).
                  04  JCN-SUFFIX-PC  PIC X(2).
      WORKING-STORAGE SECTION.
      77  SWUC-DIGIT4                      PIC X(4).
      77  PREV-SWUC-DIGIT4                 PIC X(4).
      77  SAVE-J                           PIC 9(3).
      77  HDR1      PIC X(29) VALUE 'D I S P L A Y  O F  I N P U T'.
      77  I                                PIC 9(3).
      77  J                                PIC 9(3).
      77  K                                PIC 9(3).
      77  L                                PIC 9(3).
      77  NSWUC                            PIC 9(3).
      77  NPWUC                            PIC 9(3).
      77  NFDWUC                           PIC 9(3).
      77  BUNOKEY                          PIC 9(6).
      77  COUNT                            PIC 9(3).
      77  IJ                               PIC 9(3).
      77  ICOUNT                           PIC 9(3).
      77  COUN1                            PIC 9(3).
      77  L2                               PIC 9(3).
      77  PCOUNT                           PIC 9(3).
      77  L1                               PIC 9(3).
      77  DATE-DIFF                        PIC S9(5) TRAILING.
      77  ML1DAT                           PIC 9(5).
      77  SAVE-COUN2                       PIC 9(3).
      77  COUN2                            PIC 9(3).
      77  LO                               PIC 9(3).
      77  MATRIX-IDX                       PIC 9(3).
      77  CARD-COUNT                       PIC 9(2).
      77  FT-SWT                           PIC X(3).
      77  PC-SWT                           PIC X.
      77  ML1DTE-IDX                       PIC 9(3).
      77  SAVE-COUN1                       PIC 9(3).
      77  FRR-IDX                          PIC 9(2).
      77  MINIMUM-POS-VALUE                PIC 9(8).
      77  JCNO-IDX                         PIC 9(3).
      77  NC-SWT                           PIC X.
      77  LINE-COUNT                       PIC 9(3).
      77  INDX1                            PIC 9(3).
      77  INDX2                            PIC 9(3).
      77  INDX3                            PIC 9(3).
      77  BIN-DIFF                         PIC S9(3) TRAILING.
      77  IBUF-IDX                         PIC 9(3).
      77  INTEGER-YR                       PIC  9(2).
      77  YR-DIFF                          PIC  S9(2) TRAILING.
      77  MOD-ICOUNT                       PIC 9(3).
      77  REM-COUN2          PIC 999  VALUE ZEROS.
      77  CNC-SWT            PIC X  VALUE SPACE.
      77  CHECK-PI-REC-COUNT  PIC 9(5)  VALUE ZERO.
      77  NOMKEY1                          PIC X(16).
      77  NOMKEY2                          PIC X(16).
      77  RESTART-ANS  PIC X.
      01  CONTROL-COUNTERS.
          03  REC-CNT         PIC 9(5)  VALUE ZEROS.
          03  CTRR                PIC 9(5).
          03  NEXT-CHECK-POINT           PIC 9(5).
      01  BUFFER-DATES.
          02 SUB-BUFFER-DATE1              PIC 9(5).
          02 BUFFER-DATE1 REDEFINES SUB-BUFFER-DATE1.
              03 BUFFER-DATE1-YR           PIC 9(2).
              03 BUFFER-DATE1-DAY          PIC 9(3).
          02 SUB-BUFFER-DATE2              PIC 9(5).
```

```
               02 BUFFER-DATE2 REDEFINES SUB-BUFFER-DATE2.
                   03 BUFFER-DATE2-YR          PIC 9(2).
                   03 BUFFER-DATE2-DAY         PIC 9(3).
      ***
          01   INPUT-CARD-REC1.
               02 INPUT-VALUE1                 PIC 9(3).
               02 INPUT-VALUE1E   REDEFINES INPUT-VALUE1    PIC X(3).
          01   INPUT-CARD-REC2.
               02 INPUT-REC2 OCCURS 11 TIMES.
                   03 INPUT-VALUE2             PIC X(5).
                   03 FILLER                   PIC X(2).
          01   INPUT-CARD-REC3.
               02 FILLER                       PIC X(2).
               02 INPUT-L                      PIC 9(6)V99.
               02 INPUT-LE     REDEFINES INPUT-L    PIC X(8).
               02 FILLER                       PIC X(2).
               02 INPUT-M                      PIC 9(6)V99.
               02 INPUT-MF     REDEFINES INPUT-M    PIC X(8).
               02 FILLER                       PIC X(2).
               02 INPUT-DL                     PIC 9(6)V99.
               02 INPUT-DLE     REDEFINES INPUT-DL    PIC X(8).
               02 FILLER                       PIC X(2).
               02 INPUT-DM                     PIC 9(6)V99.
               02 INPUT-DME     REDEFINES INPUT-DM    PIC X(8).
               02 FILLER                       PIC X(2).
               02 INPUT-DT                     PIC 9(6)V99.
               02 INPUT-DTE     REDEFINES INPUT-DT    PIC X(8).
               02 FILLER                       PIC X(2).
               02 INPUT-AT                     PIC 9(6)V99.
               02 INPUT-ATE     REDEFINES INPUT-AT    PIC X(8).
      ***
      ***
          01   PREV-4DIGIT-WUC                 PIC X(4).
          01   WUC-4DIGIT                      PIC X(4).
      ***
          01   SWUC-TABLE.
               02 SWUC-TAB OCCURS 300 TIMES.
                   03 SWUC                     PIC X(5).
      ***
          01   PWUC-TABLE.
               02 PWUC-TAB OCCURS 300 TIMES.
                   03 PWUC                     PIC X(5).
      ***
          01   MAINT-COST-TABLE.
               02 MAINT-TAB OCCURS 50 TIMES COMP-3.
                   03 LCOST                    PIC 9(6)V99.
                   03 MCOST                    PIC 9(6)V99.
                   03 DLCOST                   PIC 9(6)V99.
                   03 DMCOST                   PIC 9(6)V99.
                   03 DTCOST                   PIC 9(6)V99.
                   03 ATCOST                   PIC 9(6)V99.
      ***
          01   DEPOT-TABLE.
               02 DEPOT-TAB OCCURS 300 TIMES COMP-3.
                   03 PCDPOT                   PIC 9(6)V99.
                   03 PNCDPT                   PIC 9(6)V99.
                   03 RDEPOT                   PIC 9(6)V99.
                   03 NCDPOT                   PIC 9(6)V99.
                   03 PCATRT                   PIC 9(6)V99.
                   03 PNCATT                   PIC 9(6)V99.
                   03 RATTRIT                  PIC 9(6)V99.
                   03 NCATRT                   PIC 9(6)V99.
      ***
          01   PC-COST-TABLE.
               02 PC-TAB OCCURS 300 TIMES COMP-3.
                   03 PCACT                    PIC 9(3).
                   03 PCMMH                    PIC 9(7)V9.
                   03 PCMU                     PIC 9(7)V9.
                   03 PCS                      PIC 9(7)V9.
                   03 PCAWM                    PIC 9(7)V9.
      ***
          01   PNC-TABLE.
               02 PNC-TAB OCCURS 300 TIMES COMP-3.
                   03 PNCACT                   PIC 9(3).
                   03 PNCMMH                   PIC 9(7)V9.
                   03 PNCMU                    PIC 9(7)V9.
                   03 PNCS                     PIC 9(7)V9.
```

```
00385               03 PNCAWM                     PIC 9(7)V9.
00386 ***
00387          01  NC-COST-TABLE.
00388              02 NC-TAB OCCURS 300 TIMES COMP-3.
00389                 03 NCACT                    PIC 9(3).
00390                 03 NCMMH                    PIC 9(7)V9.
00391                 03 NCMU                     PIC 9(7)V9.
00392                 03 NCS                      PIC 9(7)V9.
00393                 03 NCAWM                    PIC 9(7)V9.
00394 ***
00395          01  R-COST-TABLE.
00396              02 R-TAB OCCURS 300 TIMES COMP-3.
00397                 03 RACT                     PIC 9(3).
00398                 03 RMMH                     PIC 9(7)V9.
00399                 03 RMU                      PIC 9(7)V9.
00400                 03 RS                       PIC 9(7)V9.
00401                 03 RAWM                     PIC 9(7)V9.
00402 ***
00403          01  KOUNT1-TABLE.
00404              02 KOUNT1-TAB OCCURS 250 TIMES.
00405                 03 KOUNT1                   PIC 9(3).
00406 ***
00407 ***
00408          01  KOUNT2-TABLE.
00409              02 KOUNT2-TAB OCCURS 250 TIMES.
00410                 03 KOUNT2                   PIC 9(3).
00411 ***
00412          01  JCNKEY2.
00413              02 JCNKEY2-NUM.
00414                 03 JCNKEY2-DATE             PIC 9(5).
00415                 03 JCNKEY2-SEQUENCE         PIC 9(3).
00416              03 JCNKEY2-SUFFIX              PIC X(2).
00417 ***
00418          01  JCNKEY.
00419              02 JCNKEY-NUM.
00420                 03 JCNKEY-DATE              PIC 9(5).
00421                 03 JCNKEY-SEQUENCE          PIC 9(3).
00422              02 JCNKEY-SUFFIX               PIC X(2).
00423 ***
00424          01  BUFFER-TABLE.
00425              02 BUFFER-TAB OCCURS 250 TIMES.
00426                 03 BUFMMH                   PIC 9(7).
00427                 03 BUFMU                    PIC 9(7).
00428                 03 BUFS                     PIC 9(7).
00429                 03 BUFAWM                   PIC 9(7).
00430                 03 JBUFFR                   PIC 9(3).
00431                 03 IBUFFR                   PIC 9(3).
00432                 03 DEPBUF                   PIC 9(7).
00433                 03 ATTBUF                   PIC 9(7).
00434 ***
00435          01  JCNO-TABLE.
00436              02 JCNO-TAB OCCURS 250 TIMES.
00437                 03 JCNO.
00438                    04 JCNO-NUM.
00439                       05 JCNO-DATE        PIC 9(5).
00440                       05 JCNO-SEQUENCE       PIC 9(3).
00441                    04 JCNO-SUFFIX           PIC X(2).
00442                 03 JCNO-TAG                 PIC X.
00443                 03 MLIDIF                   PIC 9(5).
00444 ***
00445          01  EXTRA-COST-TABLE.
00446              02 EXTRA-COST-TAB OCCURS 300 TIMES COMP-3.
00447                 03 RLCOST                   PIC 9(7)V99.
00448                 03 RMCOST                   PIC 9(7)V99.
00449                 03 RDEPLCST                 PIC 9(7)V99.
00450                 03 RDEPMCST                 PIC 9(7)V99.
00451                 03 RDEPTCST                 PIC 9(7)V99.
00452                 03 RATRTCST                 PIC 9(7)V99.
00453                 03 PCLCST                   PIC 9(7)V99.
00454                 03 PCMCST                   PIC 9(7)V99.
00455                 03 PCDEPLCST                PIC 9(7)V99.
00456                 03 PCDEPMCST                PIC 9(7)V99.
00457                 03 PCDEPTCST                PIC 9(7)V99.
00458                 03 PCATRTCST                PIC 9(7)V99.
00459                 03 NCLCST                   PIC 9(7)V99.
00460                 03 NCMCST                   PIC 9(7)V99.
00461                 03 NCDEPLCST                PIC 9(7)V99.
```

```
                     03 NCDEPMCST               PIC 9(7)V99.
                     03 NCDEPTCST               PIC 9(7)V99.
                     03 NCATRICST               PIC 9(7)V99.
                     03 PNCLCST                 PIC 9(7)V99.
                     03 PNCMCST                 PIC 9(7)V99.
                     03 PNCDEPLCST              PIC 9(7)V99.
                     03 PNCDEPMCST              PIC 9(7)V99.
                     03 PNCDEPTCST              PIC 9(7)V99.
                     03 PNCATRICST              PIC 9(7)V99.
 ***
          01  TOTAL-TABLE.
              02 TOT-ACT                        PIC 9(5).
              02 TOT-MMH                        PIC 9(8)V9.
              02 TOT-NORMU                      PIC 9(8)V9.
              02 TOT-NORS                       PIC 9(8)V9.
              02 TOT-AWM                        PIC 9(8)V9.
              02 TOT-LABOR                      PIC 9(9)V99.
              02 TOT-MAT                        PIC 9(9)V99.
              02 TOT-DLABOR                     PIC 9(9)V99.
              02 TOT-DMAT                       PIC 9(9)V99.
              02 TOT-DTRANS                     PIC 9(9)V99.
              02 TOT-DDISC                      PIC 9(9)V99.
 ***
          01  JBW-NOMINAL-KEY.
              02 JBW-NOM-WUC                    PIC X(5).
              02 JBW-NOM-BN                     PIC 9(6).
              02 JBW-NOM-JCN-NUM                PIC 9(8).
              02 JBW-NOM-JCN-SUFFIX             PIC X(2).
 ***
          01  MATRIX-NOMINAL-KEY.
              02 MATRIX-NOM-KEY                 PIC 9(3).
 ***
          01  JB-NOMINAL-KEY.
              02 JB-NOM-BN                      PIC 9(6).
              02 JB-NOM-JCN-NUM                 PIC 9(8).
              02 JB-NOM-JCN-SUFFIX              PIC X(2).
 ***
          01  PC-NOM-KEY.
              02  PC-NOM-BN  PIC 9(6).
              02  PC-NOM-JCN.
                     03  PC-NOM-JCN-DATE  PIC 9(5).
                     03  PC-NOM-JCN-SEQUENCE  PIC 9(3).
                     03  PC-NOM-JCN-SUFFIX  PIC X(2).
 ***
          01  NC-NOM-KEY.
              02  NC-NOM-BN  PIC 9(6).
              02  NC-NOM-JCN.
                     03  NC-NOM-JCN-DATE  PIC 9(5).
                     03  NC-NOM-JCN-SEQUENCE  PIC 9(3).
                     03  NC-NOM-JCN-SUFFIX  PIC X(2).
 ***
          01  GEN-JBW-KEY2.
              02 GEN-JBW-KEY2-WUC               PIC X(5).
              02 GEN-JBW-KEY2-BN                PIC 9(6).
 ***
          01  GEN-JBW-KEY1.
              02 GEN-JBW-KEY1-WUC               PIC X(5).
 ***
          01  ERROR-MESSAGE-TABLE.
              02 ERROR-MESSAGE.
                     03 FILLER                  PIC X(45) VALUE
                           'INPUT VALUES ARE MISSING                      '.
                     03 FILLER                  PIC X(45) VALUE
                           'NUMBER OF WU-CODES IS 1 SPECIFIED             '.
                     03 FILLER                  PIC X(45) VALUE
                           'RANGE VALUE OF CAUSATIVE WU-CODES IS MISSING  '.
                     03 FILLER                  PIC X(45) VALUE
                           'NUMBER OF CAUSATIVE WU-CODES IS 1 SPECIFIED   '.
                     03 FILLER                  PIC X(45) VALUE
                           'RANGE VALUE OF LABOR-COSTS IS MISSING         '.
                     03 FILLER                  PIC X(45) VALUE
                           'NUMBER OF LABORS-COSTS IS 1 SPECIFIED         '.
                     03 FILLER                  PIC X(45) VALUE
                           'INPUT FUNC RELATIONS IS 1 SPECIFIED           '.
                     03 FILLER                  PIC X(45) VALUE
                           'INVALID WRITE TO S-FILE                       '.
              02 ERR-TAB REDEFINES ERROR-MESSAGE OCCURS 8 TIMES.
```

```
             03 ERR-MSG              PIC X(45).
***
          01  HEADING-1.
              02 FILLER              PIC X(44) VALUE SPACE.
              02 FILLER              PIC X(45) VALUE
                 'R E P O R T E D   I N D U C E D   D E F E C T S'.
              02 FILLER              PIC X(43) VALUE SPACE.
          01  HEADING-2.
              02 FILLER              PIC X(7)  VALUE SPACE.
              02 FILLER              PIC X(50) VALUE
                 'D E F E C T S   I N D U C E D   O N   P H Y S I C A L'.
              02 FILLER              PIC X(50) VALUE
                 ' L Y   R E L A T E D   I T E M S   B Y   C O R R E C T'.
              02 FILLER              PIC X(19) VALUE
                 ' I V E   A C T I O N'.
              02 FILLER              PIC X(6)  VALUE SPACE.
          01  HEADING-3.
              02 FILLER              PIC X(18) VALUE SPACE.
              07 FILLER              PIC X(50) VALUE
                 'D E F E C T S   I N D U C E D   I N T E R N A L L Y '.
              02 FILLER              PIC X(50) VALUE
                 ' B Y   N O N - C O R R E C T I V E   A C T I O N    '.
              02 FILLER              PIC X(14) VALUE SPACE.
          01  HEADING-4.
              02 FILLER              PIC X(50) VALUE
                 '  D E F E C T S   I N D U C E D   O N   P H Y S I C A'.
              02 FILLER              PIC X(50) VALUE
                 ' L L Y   R E L A T E D   I T E M S   B Y   N O N - C O'.
              02 FILLER              PIC X(32) VALUE
                 ' R R E C T I V E   A C T I O N    '.
          01  HEADING-5.
              02 FILLER              PIC X(19) VALUE SPACE.
              02  FILLER             PIC X(76)  VALUE
              '- - - - - - - - - - - ORGANIZATIONAL & INTERMEDIATE COSTS - -
              '- - - - - - - - - - '.
              02 FILLER              PIC X(30) VALUE
                 '-    - - - - - - DEPOT COSTS - - '.
              02 FILLER              PIC X(7)  VALUE
                 '- - - - -'.
          01  HEADING-6.
              02 FILLER              PIC X(18) VALUE
                 ' WORK UNIT ACTION '.
              02 FILLER              PIC X(22) VALUE
                 ' MMH-TIME NORMU-TIME  '.
              02 FILLER              PIC X(20) VALUE
                 ' NORS-TIME  AWM-TIME'.
              02 FILLER              PIC X(25) VALUE
                 '  LABOR COST    MATERIAL '.
              02 FILLER              PIC X(25) VALUE
                 '    DISCARD        LABOR  '.
              02 FILLER              PIC X(22) VALUE
                 '  MATERIAL  TRANSPORT.'.
          01  HEADING-7.
              02 FILLER              PIC X(16) VALUE
                 '  CODE       (QTY'.
              02 FILLER              PIC X(24) VALUE
                 ')    (HOURS)    (HOURS)   '.
              02 FILLER              PIC X(30) VALUE
                 '  (HOURS)     (HOURS)       ($) '.
              02 FILLER              PIC X(15) VALUE
                 '          ($)    '.
              02 FILLER              PIC X(15) VALUE
                 '       ($)       '.
              02 FILLER              PIC X(32) VALUE
                 '    ($)          ($)           ($)    '.
***
          01  DETAIL-LINE.
              02 FILLER              PIC X(2) VALUE SPACE.
              02 D-WUC               PIC X(5).
              02 FILLER              PIC X(5) VALUE SPACE.
              02 D-ACT               PIC Z(4)9.
              02 D-MMH               PIC Z(8).9.
              02 FILLER              PIC X VALUE SPACE.
              02 D-NORMU             PIC Z(8).9.
              02 FILLER              PIC X(2) VALUE SPACE.
              02 D-NORS              PIC Z(8).9.
              02 D-AWM               PIC Z(8).9.
```

```
                    02 D-LABOR                          PIC Z(9).99.
                    02 D-MAT                            PIC Z(9).99.
                    02 D-DDISC                          PIC Z(9).99.
                    02 D-DLABOR                         PIC Z(9).99.
                    02 D-DMAT                           PIC Z(9).99.
                    02 D-DTRANS                         PIC Z(9).99.
                01  DETAIL-LINE2 REDEFINES DETAIL-LINE.
                    05  FILLER                          PIC X(51).
                    05  D-HDR                           PIC X(29).
                    05  FILLER                          PIC X(52).
                01  DETAIL-LINE3 REDEFINES DETAIL-LINE.
                    05  FILLER                          PIC X(7).
                    05  D-TITLE1                        PIC X(14).
                    05  D-DATA5                         PIC X(2).
                    05  D-TITLE2                        PIC X(26).
                    05  FILLER                          PIC X(83).
                01  DETAIL-LINE4 REDEFINES DETAIL-LINE.
                    05  FILLER                          PIC X(10).
                    05  D-DATA1                         PIC ZZZ.
                    05  FILLER                          PIC X(42).
                    05  D-DATA2                         PIC X(5).
                    05  FILLER                          PIC X(72).
                01  DETAIL-LINE5 REDEFINES DETAIL-LINE.
                    05  FILLER                          PIC X(10).
                    05  D-DATA3                         PIC XXXX.
                    05  FILLER                          PIC X(39).
                    05  D-DATA4                         PIC ZZZZZZ.99.
                    05  FILLER                          PIC X(70).
                01  DETAIL-LINF6 REDEFINES DETAIL-LINE.
                    05  FILLEP                          PIC X(7).
                    05  D-TITLE3                        PIC X(14).
                    05  FILLER                          PIC XXX.
                    05  D-TITLE4                        PIC X(9).
                    05  FILLER                          PIC XXX.
                    05  D-TITLE5                        PIC X(12).
                    05  FILLER                          PIC XXX.
                    05  D-TITLE6                        PIC X(12).
                    05  FILLER                          PIC XXX.
                    05  D-TITLE7                        PIC X(14).
                    05  FILLER                          PIC XXX.
                    05  D-TITLE8                        PIC X(20).
                    05  FILLER                          PIC XXX.
                    05  D-TITLE9                        PIC X(15).
                    05  FILLER                          PIC X(12).
                01  DETAIL-LINE7 REDEFINES DETAIL-LINE.
                    05  FILLER                          PIC X(10).
                    05  D-DATA6                         PIC XXXX.
                    05  FILLER                          PIC X(10).
                    05  D-DATA7                         PIC ZZZZZZ.99.
                    05  FILLER                          PIC X(6).
                    05  D-DATA8                         PIC ZZZZZZ.99.
                    05  FILLER                          PIC X(5).
                    05  D-DATA9                         PIC ZZZZZZ.99.
                    05  FILLER                          PIC X(8).
                    05  D-DATA10                        PIC ZZZZZZ.99.
                    05  FILLER                          PIC X(14).
                    05  D-DATA11                        PIC ZZZZZZ.99.
                    05  FILLER                          PIC X(9).
                    05  D-DATA12                        PIC ZZZZZZ.99.
                    05  FILLER                          PIC X(12).

      ***
                PROCEDURE DIVISION.
                OPEN-FILES.
                    OPEN INPUT JBW-FILE
                               JB-FILE
                               MATRIX-FILE
                               INPUT-CARD-FILE1.
                    OPEN OUTPUT PRINT-FILE.
                    OPEN I-O  PC-LIST-FILE.
                    OPEN I-O  NC-LIST-FILE.
                PRELIM-SECTION.
                    MOVE ZERO TO I.
                    MOVE ZERO TO J.
                    MOVE ZERO TO K.
                    MOVE ZERO TO L.
                    MOVE LOW-VALUE TO PC-NOM-KEY.
```

```
           MOVE LOW-VALUE TO NC-NOM-KEY.
           MOVE LOW-VALUE TO JAW-NOMINAL-KEY.
           MOVE LOW-VALUE TO JB-NOMINAL-KEY.
           MOVE LOW-VALUE TO MATRIX-NOMINAL-KEY.
       READ-NSWUC.
           READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC1 AT END
                                              MOVE 1 TO ERR-IDX
                                              PERFORM ERR-RTN THRU
                                                      ERR-RTN-END
                                              GO TO END-JOB.
           EXAMINE INPUT-VALUE1E REPLACING ALL SPACES BY ZERO.
           MOVE INPUT-VALUE1 TO NSWUC.
       READ-SWUC.
           MOVE ZERO TO CARD-COUNT.
           READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC2 AT END
                                              MOVE 2 TO ERR-IDX
                                              PERFORM ERR-RTN THRU
                                                      ERR-RTN-END
                                              GO TO END-JOB.
       SWUC-INCR-J.
           ADD 1 TO J.
           IF J IS GREATER THAN NSWUC GO TO READ-NPWUC.
           ADD 1 TO CARD-COUNT.
           IF CARD-COUNT IS GREATER THAN 11 SUBTRACT 1 FROM J
                                                 GO TO READ-SWUC.
           MOVE INPUT-VALUE2 (CARD-COUNT) TO SWUC (J).
           GO TO SWUC-INCR-J.
       READ-NPWUC.
           READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC1 AT END
                                              MOVE 3 TO ERR-IDX
                                              PERFORM ERR-RTN THRU
                                                      ERR-RTN-END
                                              GO TO END-JOB.
           EXAMINE INPUT-VALUE1E REPLACING ALL SPACES BY ZERO.
           MOVE INPUT-VALUE1 TO NPWUC.
       READ-PWUC.
           MOVE ZERO TO CARD-COUNT.
           READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC2 AT END
                                              MOVE 4 TO ERR-IDX
                                              PERFORM ERR-RTN THRU
                                                      ERR-RTN-END
                                              GO TO END-JOB.
       PWUC-INCR-I.
           ADD 1 TO I.
           IF I IS GREATER THAN NPWUC GO TO READ-NFDWUC.
           ADD 1 TO CARD-COUNT.
           IF CARD-COUNT IS GREATER THAN 11 SUBTRACT 1 FROM I
                                                 GO TO READ-PWUC.
           MOVE INPUT-VALUE2 (CARD-COUNT) TO PWUC (I).
           GO TO PWUC-INCR-I.
       READ-NFDWUC.
           READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC1 AT END
                                              MOVE 5 TO ERR-IDX
                                              PERFORM ERR-RTN THRU
                                                      ERR-RTN-END
                                              GO TO END-JOB.
           EXAMINE INPUT-VALUE1E REPLACING ALL SPACES BY ZERO.
           MOVE INPUT-VALUE1 TO NFDWUC.
       READ-MAINTCOSTS.
           ADD 1 TO L.
           IF L IS GREATER THAN NFDWUC GO TO DISP-MESS.
           READ INPUT-CARD-FILE1 INTO INPUT-CARD-REC3 AT END
                                              MOVE 6 TO ERR-IDX
                                              PERFORM ERR-RTN THRU
                                                      ERR-RTN-END
                                              GO TO END-JOB.
           EXAMINE INPUT-LE REPLACING ALL SPACES BY ZERO.
           MOVE INPUT-L TO LCOST (L).
           EXAMINE INPUT-ME REPLACING ALL SPACES BY ZERO.
           MOVE INPUT-M TO MCOST (L).
           EXAMINE INPUT-DLE REPLACING ALL SPACES BY ZERO.
           MOVE INPUT-DL TO DLCOST (L).
           EXAMINE INPUT-DME REPLACING ALL SPACES BY ZERO.
           MOVE INPUT-DM TO DMCOST (L).
           EXAMINE INPUT-DTE REPLACING ALL SPACES BY ZERO.
           MOVE INPUT-DT TO DTCOST (L).
           EXAMINE INPUT-ATE REPLACING ALL SPACES BY ZERO.
```

```
               MOVE INPUT-AT TO AICOST (L).
               GO TO READ-MAINTCOSTS.
 ***
 ***
           DISP-MESS.
               DISPLAY 'IS THIS A RESTART ' UPON CONSOLE.
               ACCEPT RESTART-ANS FROM CONSOLE.
               DISPLAY ' ENTER THE NUMBER OF RECORDS TO PROCESS'
                   UPON CONSOLE.
               DISPLAY 'BETWEEN FILE REORGANIZATION.' UPON CONSOLE.
               ACCEPT NEXT-CHECK-POINT      FROM CONSOLE.
               MOVE NEXT-CHECK-POINT TO CTRR.
               IF RESTART-ANS = 'N' NEXT SENTENCE ELSE
                                    PERFORM RESTART THRU RESTART-END
                                    GO TO INCR-J.
           TOP-OF-PAGE.
               MOVE ZERO TO LINE-COUNT.
               MOVE SPACES TO DETAIL-LINE.
               MOVE HDR1 TO D-HDR.
               WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 0 LINES.
               MOVE SPACES TO DETAIL-LINE.
               MOVE ALL '-' TO D-HDR.
               WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 1 LINES.
               MOVE SPACES TO DETAIL-LINE.
               MOVE 'SUBJECT WUC = ' TO D-TITLE1.
               MOVE SWUC (1) TO D-DATA5.
               WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 3 LINES.
           PWUC-HEADER.
               MOVE SPACES TO DETAIL-LINE.
               MOVE '  PHYSICAL WORK UNIT CODES' TO D-TITLE2.
               WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 2 LINES.
               MOVE ALL '-' TO D-TITLE2.
               WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 1 LINES.
               MOVE SPACES TO DETAIL-LINE.
               MOVE '  INDEX         ' TO D-TITLE1.
               MOVE '     WUC                    ' TO D-HDR.
               WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 2 LINES.
               MOVE SPACES TO DETAIL-LINE.
               MOVE '  -----         ' TO D-TITLE1.
               MOVE '     ---                    ' TO D-HDR.
               WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 1 LINES.
           TOP-OF-PAGE-END.
               MOVE 1 TO I.
           PWUC-PRINT.
               IF  LINE-COUNT IS GREATER THAN 30
                   PERFORM TOP-OF-PAGE
                   PERFORM  PWUC-HEADER.
               MOVE SPACES TO DETAIL-LINE.
               MOVE I TO D-DATA1.
               MOVE PWUC (I) TO D-DATA2.
               WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 2 LINES.
               ADD 1 TO LINE-COUNT.
               ADD 1 TO I.
               IF  I IS GREATER THAN NPWUC
                   NEXT SENTENCE
               ELSE
                   GO TO PWUC-PRINT.
               PERFORM TOP-OF-PAGE.
           MCOST-HEADER.
               MOVE SPACES TO DETAIL-LINE.
               MOVE '  AVERAGE MAINTENANCE COSTS' TO D-HDR.
               WRITE PRINT-RECORD FROM DETAIL-LINE
                     AFTER POSITIONING 2 LINES.
               MOVE SPACES TO DETAIL-LINE.
               MOVE 'FOUR-DIGIT-WUC' TO D-TITLE3.
               MOVE 'O&I LABOR' TO D-TITLE4.
               MOVE 'O&I MATERIAL' TO D-TITLE5.
               MOVE ' DEPOT LABOR' TO D-TITLE6.
               MOVE 'DEPOT MATERIAL' TO D-TITLE7.
```

```
              MOVE 'DEPOT TRANSPORTATION' TO D-TITLE8.
              MOVE 'I-LEVEL DISCARD' TO D-TITLE9.
              WRITE PRINT-RECORD FROM DETAIL-LINE
                    AFTER POSITIONING 2 LINES.
              MOVE SPACES TO DETAIL-LINE.
              MOVE ' ($/HOUR)' TO D-TITLE4.
              MOVE ' ($/ACTION)' TO D-TITLE5.
              MOVE '($/TRANSFER)' TO D-TITLE6.
              MOVE ' ($/TRANSFER)' TO D-TITLE7.
              MOVE '      ($/TRANSFER)' TO D-TITLE8.
              MOVE '    ($/ATTRIT)' TO D-TITLE9.
              WRITE PRINT-RECORD FROM DETAIL-LINE
                    AFTER POSITIONING 1 LINES.
              MOVE SPACES TO DETAIL-LINE.
              MOVE SPACES TO PREV-SWUC-DIGIT4.
              MOVE ZERO TO K.
              MOVE 1 TO I.
          MCOST-PRINT.
              IF  LINE-COUNT IS GREATER THAN 30
                  PERFORM TOP-OF-PAGE
                  PERFORM MCOST-HEADER.
              MOVE SWUC (I) TO SWUC-DIGIT4.
              IF  SWUC-DIGIT4 = PREV-SWUC-DIGIT4
                  ADD 1 TO I
                  GO TO MCOST-PRINT.
              MOVE SWUC-DIGIT4 TO PREV-SWUC-DIGIT4.
              ADD 1 TO K.
              MOVE SPACES TO DETAIL-LINE.
              MOVE PREV-SWUC-DIGIT4 TO D-DATA6.
              MOVE LCOST  (K) TO D-DATA7.
              MOVE MCOST  (K) TO D-DATA8.
              MOVE DLCOST (K) TO D-DATA9.
              MOVE DMCOST (K) TO D-DATA10.
              MOVE DTCOST (K) TO D-DATA11.
              MOVE AICOST (K) TO D-DATA12.
              WRITE PRINT-RECORD FROM DETAIL-LINE
                    AFTER POSITIONING 2 LINES.
              ADD 1 TO LINE-COUNT.
              ADD 1 TO I.
              IF  K = NFDWUC
                  NEXT SENTENCE
              ELSE
                  GO TO MCOST-PRINT.
***
          START-PROCESS.
              MOVE ZERO TO J.
          ZERO-PNC-PC-TABLES.
              ADD 1 TO J.
              IF J IS GREATER THAN NSWUC MOVE ZERO TO J
                                         GO TO INCR-J.
              MOVE ZERO TO PCACT (J), PCMMH (J), PCMU (J), PCS (J),
                           PCAWM (J), PCDPOT (J), PCAIRT (J),
                           PNCACT (J), PNCMMH (J), PNCMU (J), PNCS (J),
                           PNCAWM (J), PNCDPT (J), PNCATT (J).
              MOVE ZERO TO NCACT (J), NCMMH (J), NCMU (J), NCS (J),
                           NCAWM (J), NCDPOT (J), NCAIRT (J),
                           RACT (J), RMMH (J), RMU (J), RS (J),
                           RAWM (J), RDEPOT (J), RATTRIT (J).
              GO TO ZERO-PNC-PC-TABLES.
          INCR-J.
              ADD 1 TO J.
              IF J IS GREATER THAN NSWUC
**   19                    PERFORM PRINT-RTN THRU PRINT-RTN-END
              DISPLAY ' IT IS FINALLY OVER. THANK YOU.' UPON CONSOLE
     20                    GO TO END-JOB.
              IF CHECK-PT-REC-COUNT IS NOT LESS THAN NEXT-CHECK-POINT
                  DISPLAY 'DO NOT CANCEL AT THIS POINT          '
                  UPON CONSOLE
                                     PERFORM CHECK-POINT
                                     THRU CHECK-POINT-END
                                 PERFORM REORG-FILES THRU REORG-EXIT
                  DISPLAY 'IF THE OK TO CANCEL HAS BEEN GIVEN,'
                      UPON CONSOLE
                  DISPLAY 'IT IS OK TO DO SO AT THIS TIME.'
                      UPON CONSOLE.
              MOVE SWUC (J) TO GEN-JBW-KEY1-WUC.
              START JBW-FILE KEY = GEN-JBW-KEY1 INVALID KEY GO TO INCR-J.
```

```
       READ-JBW-FILE.
           READ JBW-FILE AT END GO TO INCR-J.
           IF JBW-HU-CODE NOT = SWUC (J) GO TO INCR-J.
           ADD 1 TO REC-CNT.
           IF REC-CNT = CTRR
               ADD  NEXT-CHECK-POINT TO CTRR
               DISPLAY 'PROCESSED RECORDS ' REC-CNT UPON CONSOLE.
           ADD 1 TO CHECK-PT-REC-COUNT.
           MOVE JBW-BUREAU-NUMBER TO BUNOKEY.
       SET-CNC-SWT.
           MOVE '0' TO CNC-SWT.
           IF  JBW-ATC-LEVEL1 = 'P' MOVE '1' TO CNC-SWT.
           IF  JBW-ATC-LEVEL1 = 'Q' MOVE '1' TO CNC-SWT.
           IF  JBW-ATC-LEVEL1 = 'S' MOVE '1' TO CNC-SWT.
           IF  JBW-ATC-LEVEL1 = 'T' MOVE '1' TO CNC-SWT.
           IF  JBW-ATC-LEVEL1 = 'U' MOVE '1' TO CNC-SWT.
           IF  JBW-ATC-LEVEL1 = 'B' MOVE '2' TO CNC-SWT.
           IF  JBW-ATC-LEVEL1 = 'C' MOVE '2' TO CNC-SWT.
           IF  JBW-ATC-LEVEL1 NOT = 'R' GO TO CHECK-HMC-FOR-RACT.
           IF  JBW-ATC-LEVEL2 = 'B' MOVE '2' TO CNC-SWT.
           IF  JBW-ATC-LEVEL2 = 'C' MOVE '2' TO CNC-SWT.
           IF  JBW-ATC-LEVEL2 IS GREATER THAN '0' MOVE '2' TO CNC-SWT.
       CHECK-HMC-FOR-RACT.
           IF  JBW-HMC-LEVEL1 = 246 OR 086 OR 877
               GO TO TEST-FOR-A.
           IF  JBW-HMC-LEVEL2 = 246 OR 086 OR 877
               GO TO TEST-FOR-A.
           GO TO CHECK-FOR-CNC.
       TEST-FOR-A.
           IF  JBW-ATC-LEVEL1 NOT = 'A' AND JBW-ATC-LEVEL2 NOT = 'A'
                                            GO TO ADD-TO-R-TABLE.
       CHECK-FOR-CNC.
           MOVE JBW-JCN TO JCNKEY.
           IF CNC-SWT = '1' GO TO TEST-ATC-LEVEL2.
           IF CNC-SWT = '2' GO TO TEST-NPWUC-FOR-PCACT.
           GO TO READ-JBW-FILE.
       ADD-TO-R-TABLE.
           ADD 1 TO RACT (J).
           ADD JBW-MMH-LEVEL1 TO RMMH (J).
           ADD JBW-NORMU-TIME TO RMU (J).
           ADD JBW-AWM-TIME TO RAWM (J).
           ADD JBW-NORS-TIME TO RS (J).
           IF  JBW-ATC-LEVEL2 NOT = SPACE ADD JBW-MMH-LEVEL2 TO RMMH (J).
           IF  JBW-ATC-LEVEL2 IS GREATER THAN '0' AND LESS THAN '9'
               ADD 1 TO RDEPOT (J).
           IF  JBW-ATC-LEVEL2 = '9' ADD 1 TO RATTRIT (J).
           GO TO CHECK-FOR-CNC.
       TEST-NPWUC-FOR-PCACT.
           IF NPWUC = 0, GO TO READ-JBW-FILE.
           PERFORM SEARCH-PC-LIST THRU SEARCH-PC-END.
           IF PC-SWT = 'Y' GO TO READ-JBW-FILE.
       SET-COUNT.
           MOVE I TO COUNT.
           MOVE J TO IJ.
           MOVE ZERO TO I.
           IF SWUC (J) IS LESS THAN PWUC (1) GO TO MOVE-1.
           IF SWUC (J) IS GREATER THAN PWUC (NPWUC) GO TO MOVE-1.
           MOVE 1 TO INDX1.
           MOVE NPWUC TO INDX3.
       CONT-THIS-BINARY-SEARCH.
           SUBTRACT INDX1 FROM INDX3 GIVING BIN-DIFF.
           IF BIN-DIFF = 1 GO TO TEST-THESE-TWO-CODES.
           ADD INDX3 TO INDX1 GIVING INDX2.
           ADD 1 TO INDX2.
           DIVIDE 2 INTO INDX2.
           IF SWUC (J) IS LESS THAN PWUC (INDX2) MOVE INDX2 TO INDX3
                                      GO TO CONT-THIS-BINARY-SEARCH.
           MOVE INDX2 TO INDX1.
           GO TO CONT-THIS-BINARY-SEARCH.
       TEST-THESE-TWO-CODES.
           IF SWUC (J) = PWUC (INDX1) MOVE INDX1 TO I.
           IF SWUC (J) = PWUC (INDX3) MOVE INDX3 TO I.
       MOVE-1.
           MOVE 1 TO IBUFFR (I).
           MOVE ZERO TO I.
           PERFORM BUFFER-MOVE THRU BUFFER-END.
       INCR-I.
```

```
        ADD 1 TO I.
        IF PWUC (I) = SWUC (J) GO TO INCR-I.
        IF I IS GREATER THAN NPWUC GO TO SET-TCOUNT.
    READ-JBW-FILE-AGAIN.
        MOVE PWUC (I) TO GEN-JBW-KEY2-WUC.
        MOVE BUNOKEY TO GFN-JBW-KEY2-BN.
        START JBW-FILE KEY = GEN-JBW-KEY2 INVALID KEY GO TO INCR-I.
    READ-JBW-AGAIN.
        READ JBW-FILE AT END GO TO INCR-I.
        IF JBW-WU-CODE NOT = PWUC (I) GO TO INCR-I.
        IF JBW-BUREAU-NUMBER NOT = BUNOKEY GO TO INCR-I.
        IF JBW-ATC-LEVEL1 = 'B' OR 'C'
                                GO TO JBW-NC-LIST.
        IF JBW-ATC-LEVEL1 NOT = 'R' GO TO READ-JBW-AGAIN.
        IF JBW-ATC-LEVEL2 = 'B' OR 'C'
                                GO TO JBW-NC-LIST.
        IF JBW-ATC-LEVEL2 IS GREATER THAN 'O'
            GO TO JBW-NC-LIST.
        GO TO READ-JBW-AGAIN.
    JBW-NC-LIST.
        PERFORM SEARCH-NC-LIST THRU SEARCH-NC-END.
        IF NC-SWT = 'Y' MOVE ZERO TO IJ
                        GO TO INCR-COUNT.
    SET-IJ-FOR-PWUC.
        MOVE ZERO TO IJ.
        IF PWUC (I) IS LESS THAN SWUC (1) GO TO INCR-COUNT.
        IF PWUC (I) IS GREATER THAN SWUC (NSWUC) GO TO INCR-COUNT.
        MOVE 1 TO INDX1.
        MOVE NSWUC TO INDX3.
    CONT-BINARY-SEARCH.
        SUBTRACT INDX1 FROM INDX3 GIVING BIN-DIFF.
        IF BIN-DIFF = 1 GO TO TEST-TWO-CODES.
        ADD INDX3 TO INDX1 GIVING INDX2.
        ADD 1 TO INDX2.
        DIVIDE 2 INTO INDX2.
        IF PWUC (I) IS LESS THAN SWUC (INDX2) MOVE INDX2 TO INDX3
                            GO TO CONT-BINARY-SEARCH.
        MOVE INDX2 TO INDX1.
        GO TO CONT-BINARY-SEARCH.
    TEST-TWO-CODES.
        IF PWUC (I) = SWUC (INDX1) MOVE INDX1 TO IJ.
        IF PWUC (I) = SWUC (INDX3) MOVE INDX3 TO IJ.
    INCR-COUNT.
        ADD 1 TO COUNT.
        MOVE I TO IBUFFR (COUNT).
        PERFORM BUFFER-MOVE THRU BUFFER-END.
        GO TO READ-JBW-AGAIN.
    SET-TCOUNT.
        MOVE COUNT TO TCOUNT.
        SUBTRACT 1 FROM TCOUNT GIVING MOD-TCOUNT.
        IF TCOUNT = 1 AND IBUFFR (1) NOT = ZERO
                                    MOVE 1 TO L2
                    MOVE 1 TO KOUNT2 (1)
                    GO TO LAST-CHRONO-SWUC.
        IF TCOUNT = 1 GO TO RETURN-JBW.
        MOVE ZERO TO L.
        MOVE 1 TO COUN2.
        MOVF COUN2 TO SAVF-COUN2.
    INCR-L.
        ADD 1 TO L.
        MOVE SAVE-COUN2 TO KOUNT2 (L).
        MOVE BUNOKEY TO BUREAU-NUMBER-PC
           MOVE JCNO (SAVE-COUN2) TO JCN-PC
           WRITE PC-RECORD INVALID KEY NEXT SENTENCE.
        IF L = TCOUNT GO TO SET-L2.
        MOVE 'Y' TO JCNO-TAG (SAVE-COUN2).
        MOVF 99999 TO MINIMUM-POS-VALUE.
    INCR-COUN2.
        ADD 1 TO COUN2.
        IF COUN2 IS GREATER THAN TCOUNT GO TO
                                 TEST-MINIMUM-POS-VALUE.
        IF JCNO-TAG (COUN2) = 'Y' GO TO INCR-COUN2.
        MOVE KOUNT2 (L) TO MLIDTE-IDX.
        MOVF MLIDTE (MLIDTE-IDX) TO SUB-BUFFER-DATE1.
        MOVE JCNO-DATF (COUN2) TO SUB-BUFFER-DATE2.
        PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
        IF DATE-DIFF IS GREATER THAN 2 GO TO INCR-COUN2.
```

```
           IF JBUFFR (COUN2) = ZERO GO TO TEST-JCNO-NUM-DIFF.
           MOVE IBUFFR (MLIDTE-IDX) TO MATRIX-NOMINAL-KEY.
           MOVE JBUFFR (COUN2) TO MATRIX-IDX.
           READ MATRIX-FILE INVALID KEY GO TO INCR-COUN2.
           IF MATRIX-VAL (MATRIX-IDX) NOT = 1
                                   GO TO INCR-COUN2.
       TEST-JCNO-NUM-DIFF.
           MOVE JCNO-DATE (MLIDTE-IDX) TO SUB-BUFFER-DATE1.
           MOVE JCNO-DATE(COUN2) TO SUB-BUFFER-DATE2
           PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
           IF DATE-DIFF IS LESS THAN ZERO GO TO INCR-COUN2.
           IF DATE-DIFF IS LESS THAN MINIMUM-POS-VALUE
                                  MOVE DATE-DIFF TO
                                      MINIMUM-POS-VALUE
                                           MOVE COUN2 TO
                                         REM-COUN2.
           GO TO INCR-COUN2.
       TEST-MINIMUM-POS-VALUE.
           IF MINIMUM-POS-VALUE = 99999 GO TO SET-L2.
           MOVE ZERO TO COUN2.
           MOVE REM-COUN2 TO SAVE-COUN2.
           GO TO INCR-L.
       SET-L2.
           MOVE L TO L2.
           MOVE ZERO TO L.
           MOVE 1 TO PCOUNT.
           MOVE 1 TO SAVE-COUNT.


       SET-MINIMUM-POSITIVE-VALUE.
           MOVE 99999 TO MINIMUM-POS-VALUE.
           MOVE 1 TO COUNT.
           MOVE 'Y' TO JCNO-TAG (SAVE-COUNT).
       INCR-COUNT.
           ADD 1 TO COUNT.
           IF COUNT IS GREATEP THAN TCOUNT GO TO
                                 TEST-MINIMUM-POS-VALUE-AGAIN.
           IF JCNO-TAG (COUNT) = 'Y' GO TO INCR-COUNT.
           MOVE MLIDTE (COUNT) TO SUB-BUFFER-DATE1.
           MOVE JCNO-DATE (PCOUNT) TO SUB-BUFFER-DATE2.
           PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
           IF DATE-DIFF IS GREATER THAN 2 GO TO INCR-COUNT.
           IF JBUFFR (PCOUNT) = ZERO GO TO TEST-JCNO-DIFF.
           MOVE IBUFFR (COUNT) TO MATRIX-NOMINAL-KEY.
           MOVE JBUFFR (PCOUNT) TO MATRIX-IDX.
           READ MATRIX-FILE INVALID KEY GO TO INCR-COUNT.
           IF MATRIX-VAL (MATRIX-IDX) NOT = 1
                                   GO TO INCR-COUNT.
       TEST-JCNO-DIFF.
           MOVE JCNO-DATE (COUNT) TO SUB-BUFFER-DATE1.
           MOVE JCNO-DATE (PCOUNT) TO SUB-BUFFER-DATE2.
           PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
           IF DATE-DIFF IS LESS THAN ZERO GO TO INCR-COUNT.
           IF DATE-DIFF IS LESS THAN MINIMUM-POS-VALUE
                                  MOVE DATE-DIFF TO
                                              MINIMUM-POS-VALUE
                                          MOVE COUNT TO
                                              SAVE-COUNT.
           GO TO INCR-COUNT.
       TEST-MINIMUM-POS-VALUE-AGAIN.
           IF MINIMUM-POS-VALUE = 99999 GO TO FIX-UP-JCNO-TAG.
           ADD 1 TO L.
           MOVE SAVE-COUNT TO KOUNT1 (L).
           IF JBUFFR (SAVE-COUNT) NOT = ZERO
           MOVE BUNOKEY TO BUREAU-NUMBER-PC
           MOVE JCNO (SAVE-COUNT) TO JCN-PC
               WRITE PC-RECORD INVALID KEY NEXT SENTENCE.
           MOVE SAVE-COUNT TO PCOUNT.
           IF L = MOD-TCOUNT GO TO FIX-UP-JCNO-TAG.
           GO TO SET-MINIMUM-POSITIVE-VALUE.
       FIX-UP-JCNO-TAG.
           MOVE ZERO TO JCNO-IDX.
       INCR-JCNO-IDX.
           ADD 1 TO JCNO-IDX.
           IF JCNO-IDX IS GREATER THAN TCOUNT GO TO END-FIX-TAG.
           MOVE 'N' TO JCNO-TAG (JCNO-IDX).
           GO TO INCR-JCNO-IDX.
       END-FIX-TAG.
           MOVE L TO L1.
           IF L1 IS LESS THAN 2 GO TO SET-LO.
           MOVE ZERO TO L.
       INCR-L1.
           ADD 1 TO L.
           IF L = L1 GO TO SET-LO.
           MOVE KOUNT1 (L) TO COUNT.
           MOVE JBUFFR (COUNT) TO K.
           IF K = ZERO GO TO INCR-L1.
           ADD 1 TO PCACT (K).
           ADD BUFMMH (COUNT) TO PCMMH (K).
           ADD BUFMU (COUNT) TO PCMU (K).
           ADD BUFS (COUNT) TO PCS (K).
           ADD BUFAWM (COUNT) TO PCAWM (K).
           ADD DEPBUF (COUNT) TO PCDPOT (K).
           ADD ATTBUF (COUNT) TO PCATRT (K).
           GO TO INCR-L1.
       SET-LO.
           MOVE 1 TO LO.
           IF L1 = ZERO MOVE 2 TO LO.
           IF L1 = ZERO AND L2 = 1 AND IBUFFR (1) NOT = ZERO
                                              GO TO LAST-CHRONO-SWUC.
           IF L1 = ZERO AND L2 = 1 GO TO RETURN-JBW.
       INCR-L-WITH-LO.
           MOVE LO TO L.
           SUBTRACT 1 FROM L.
       INCR-L2.
           ADD 1 TO L.
           IF L IS GREATER THAN L2 GO TO LAST-CHRONO-SWUC.
           MOVE KOUNT2 (L) TO COUNT.
           MOVE JBUFFR (COUNT) TO K.
           IF K = ZERO GO TO INCR-L2.
           ADD 1 TO PCACT (K).
           ADD BUFMMH (COUNT) TO PCMMH (K).
           ADD BUFMU (COUNT) TO PCMU (K).
           ADD BUFS (COUNT) TO PCS (K).
           ADD BUFAWM (COUNT) TO PCAWM (K).
           ADD DEPBUF (COUNT) TO PCDPOT (K).
           ADD ATTBUF (COUNT) TO PCATRT (K).
           GO TO INCR-L2.
       LAST-CHRONO-SWUC.
           MOVE KOUNT2(L2) TO IBUF-IDX.
           IF IBUFFR (IBUF-IDX) = 0 GO TO RETURN-JBW.
           MOVE IBUFFR(IBUF-IDX) TO MATRIX-NOM-KEY.
           READ MATRIX-FILE INVALID KEY GO TO RETURN-JBW.
           MOVE 1 TO I.
           MOVE ZERO TO IJ.
       LOOP-ON-IJ.
           ADD 1 TO IJ.
           IF IJ IS GREATER THAN NSWUC GO TO RETURN-JBW.
           IF I IS GREATER THAN NPWUC GO TO LOOP-MOVE-TO-GEN.
           IF SWUC(IJ) = PWUC(I) ADD 1 TO I
                          GO TO LOOP-ON-IJ.
           IF SWUC(IJ) IS GREATER THAN PWUC(I) ADD 1 TO I
                                               SUBTRACT 1 FROM IJ
                                               GO TO LOOP-ON-IJ.
       LOOP-MOVE-TO-GEN.
           MOVE SWUC(IJ) TO GEN-JBW-KEY2-WUC.
           MOVE BUNOKEY TO GEN-JBW-KEY2-BN.
           START JBW-FILE KEY = GEN-JBW-KEY2 INVALID KEY
                                      GO TO LOOP-ON-IJ.
       READ-JBW-ON-LOOP.
           READ JBW-FILE AT END GO TO LOOP-ON-IJ.
           IF JBW-BUREAU-NUMBER NOT = BUNOKEY GO TO LOOP-ON-IJ.
           IF JBW-WU-CODE NOT = SWUC(IJ) GO TO LOOP-ON-IJ.
           IF JBW-ATC-LEVEL1 = 'B' OR 'C'
                                      GO TO CHECK-P-MATRIX.
           IF JBW-ATC-LEVEL1 NOT = 'R' GO TO READ-JBW-ON-LOOP.
           IF JBW-ATC-LEVEL2 = 'B' OR 'C'
                                      GO TO CHECK-P-MATRIX.
           IF JBW-ATC-LEVEL2 IS GREATER THAN '0'
               GO TO CHECK-P-MATRIX.
           GO TO READ-JBW-ON-LOOP.
       CHECK-P-MATRIX.
           MOVE IJ TO MATRIX-IDX.
           IF MATRIX-VAL(MATRIX-IDX) = ZERO GO TO READ-JBW-ON-LOOP.
```

```
            IF JBW-JCN IS NOT GREATER THAN JCNO(IBUF-IDX)
                                          GO TO READ-JBW-ON-LOOP.
            MOVE MLIDTE (IBUF-IDX)     TO SUB-BUFFER-DATE1.
            MOVE JBW-JCN-DATE TO SUB-BUFFER-DATE2.
            PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
            IF DATE-DIFF IS GREATER THAN 2 GO TO LOOP-ON-IJ.
            PERFORM SEARCH-NC-LIST THRU SEARCH-NC-END.
            IF NC-SWT = 'Y' GO TO READ-JBW-ON-LOOP.
            PERFORM SEARCH-PC-LIST THRU SEARCH-PC-END.
            IF PC-SWT = 'Y' GO TO READ-JBW-ON-LOOP.
            ADD 1 TO PCACT(IJ).
            ADD JBW-MMH-LEVEL1 TO PCMMH(IJ).
            IF JBW-ATC-LEVEL1 = 'R' ADD JBW-MMH-LEVEL2 TO PCMMH (IJ).
            ADD JBW-NORMU-TIME TO PCMU(IJ).
            ADD JBW-NORS-TIME TO PCS(IJ).
            ADD JBW-AWM-TIME TO PCAWM(IJ).
            IF JBW-ATC-LEVEL1 NOT = 'R' GO TO ADD-TO-PC-LIST.
            IF JBW-ATC-LEVEL2 IS GREATER THAN '0' AND LESS THAN '9'
               ADD 1 TO PCDPOT (IJ).
            IF JBW-ATC-LEVEL2 = '9' ADD 1 TO PCATRT (IJ).
        ADD-TO-PC-LIST.
            MOVE BUNOKEY TO BUREAU-NUMBER-PC.
            MOVE JBW-JCN TO JCN-PC.
            WRITE PC-RECORD INVALID KEY GO TO RETURN-JBW.
        RETURN-JBW.
            MOVE JCNKEY TO JBW-JCN.
            MOVE BUNOKEY TO JBW-BUREAU-NUMBER.
            MOVE SWUC (J) TO JBW-WU-CODE.
            START JBW-FILE KEY = JBW-KEY INVALID KEY GO TO INCR-J.
            READ JBW-FILE AT END GO TO INCR-J.
            GO TO READ-JBW-FILE.
        TEST-ATC-LEVEL2.
            IF JBW-ATC-LEVEL2 = 'B' OR 'C'
                                          GO TO ADD-TO-NC-TABLE.
            IF JBW-ATC-LEVEL2 IS GREATER THAN '0'
               GO TO ADD-TO-NC-TABLE.
            GO TO SET-MLIDAT.
        ADD-TO-NC-TABLE.
            ADD 1 TO NCACT (J).
            ADD JBW-MMH-LEVEL2 TO NCMMH (J).
            ADD JBW-NORMU-TIME TO NCMU (J).
            ADD JBW-NORS-TIME TO NCS (J).
            ADD JBW-AWM-TIME TO NCAWM (J).
            IF JBW-ATC-LEVEL2 = 'B' OR 'C'
                                          GO TO TEST-NPWUC.
            IF JBW-ATC-LEVEL2 = '9' ADD 1 TO NCATRT (J)
                                                GO TO TEST-NPWUC.
            ADD 1 TO NCDPOT (J).
            GO TO TEST-NPWUC.
            GO TO RETURN-JBW.
        SET-MLIDAT.
            MOVE JBW-MLI-DATE TO MLIDAT.
        READ-THIRD-TIME-JBW.
            READ JBW-FILE AT END GO TO TEST-NPWUC.
            IF JBW-WU-CODE NOT = SWUC (J) GO TO TEST-NPWUC.
            IF JBW-BUREAU-NUMBER NOT = BUNOKEY GO TO TEST-NPWUC.
            IF JBW-ATC-LEVEL1 = "B' OR 'C'
                                          GO TO TEST-JBW-DATE.
            IF JBW-ATC-LEVEL1 NOT = 'R' GO TO READ-THIRD-TIME-JBW.
            IF JBW-ATC-LEVEL2 = 'B' OR 'C'
                                          GO TO TEST-JBW-DATE.
            IF JBW-ATC-LEVEL2 IS GREATER THAN '0'
               GO TO TEST-JBW-DATE.
            GO TO READ-THIRD-TIME-JBW.
        TEST-JBW-DATE.
            MOVE MLIDAT TO SUB-BUFFER-DATE1.
            MOVE JBW-JCN-DATE TO SUB-BUFFER-DATE2.
            PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
            IF DATE-DIFF IS GREATER THAN 2 GO TO TEST-NPWUC.
            PERFORM SEARCH-PC-LIST THRU SEARCH-PC-END.
            IF PC-SWT = 'Y' GO TO READ-THIRD-TIME-JBW.
            PERFORM SEARCH-NC-LIST THRU SEARCH-NC-END.
            IF NC-SWT = 'Y' GO TO READ-THIRD-TIME-JBW.
            ADD 1 TO NCACT (J).
            ADD JBW-MMH-LEVEL1 TO NCMMH (J).
            ADD JBW-NORMU-TIME TO NCMU (J).
            ADD JBW-NORS-TIME TO NCS (J).
```

```
               ADD JBW-AWM-TIME TO NCAWM (J).
               IF JBW-ATC-LEVEL1 = 'R' ADD JBW-MMH-LEVEL2 TO NCMMH (J).
               IF JBW-ATC-LEVEL2 IS GREATER THAN '0' AND LESS THAN '9'
                  ADD 1 TO NCDPOT (J).
               IF JBW-ATC-LEVEL2 = '9' ADD 1 TO NCATRT (J).
               MOVE BUNOKEY TO BUREAU-NUMBER-NC.
               MOVE JBW-JCN TO JCN-NC.
               WRITE NC-RECORD INVALID KEY GO TO TEST-NPWUC.
           TEST-NPWUC.
               IF NPWUC = ZERO GO TO RETURN-JBW.
               MOVE ZERO TO I.
               IF SWUC (J) IS LESS THAN PWUC (1) GO TO RETURN-JBW.
               IF SWUC (J) IS GREATER THAN PWUC (NPWUC) GO TO RETURN-JBW.
               MOVE 1 TO INDX1.
               MOVE NPWUC TO INDX3.
           CONT-PWUC-BINARY-SEARCH.
               SUBTRACT INDX1 FROM INDX3 GIVING BIN-DIFF.
               IF BIN-DIFF = 1 GO TO TEST-PWUC-TWO-CODES.
               ADD INDX3    INDX1 GIVING INDX2.
               ADD 1 TO INDX2.
               DIVIDE 2 INTO INDX2.
               IF SWUC (J) IS LESS THAN PWUC (INDX2) MOVE INDX2 TO INDX3
                                      GO TO CONT-PWUC-BINARY-SEARCH.
               MOVE INDX2 TO INDX1.
               GO TO CONT-PWUC-BINARY-SEARCH.
           TEST-PWUC-TWO-CODES.
               IF SWUC (J) = PWUC (INDX1) MOVE INDX1 TO I
                                          GO TO MOVE-BUNOKEY.
               IF SWUC (J) = PWUC (INDX3) MOVE INDX3 TO I
                                          GO TO MOVE-BUNOKEY.
               GO TO RETURN-JBW.
           MOVE-BUNOKEY.
               MOVE BUNOKEY TO JB-BUREAU-NUMBER.
               MOVE JCNKEY TO JB-JCN.
               START JB-FILE KEY = JB-KEY INVALID KEY GO TO RETURN-JBW.
               READ JB-FILE AT END GO TO RETURN-JBW.
           READ-JB.
               READ JB-FILE AT END GO TO RETURN-JBW.
               IF JB-BUREAU-NUMBER NOT = BUNOKEY GO TO RETURN-JBW.
               MOVE MLIDAT TO SUB-BUFFER-DATE1.
               MOVE JB-JCN-DATE TO SUB-BUFFER-DATE2.
               PERFORM DATE-DIFF-RTN THRU DATE-DIFF-END.
               IF DATE-DIFF IS GREATER THAN 2 GO TO RETURN-JBW.
               IF JB-ATC-LEVEL1 = 'B' OR 'C'
                                          GO TO JB-TEST-LISTS.
               IF JB-ATC-LEVEL1 NOT = 'R' GO TO READ-JB.
               IF JB-ATC-LEVEL2 = 'B' OR 'C'
                                          GO TO JB-TEST-LISTS.
               IF JB-ATC-LEVEL2 IS GREATER THAN '0'
                  GO TO JB-TEST-LISTS.
               GO TO READ-JB.
           JB-TEST-LISTS.
               PERFORM SEARCH-PC-JB THRU SEARCH-PC-JB-END.
               IF PC-SWT = 'Y' GO TO READ-JB.
               PERFORM SEARCH-NC-JB THRU SEARCH-NC-JB-END.
               IF NC-SWT = 'Y' GO TO READ-JB.
           INCR-IJ.
               MOVE ZERO TO IJ.
               IF JB-WU-CODE IS LESS THAN SWUC (1) GO TO READ-JB.
               IF JB-WU-CODE IS GREATER THAN SWUC (NSWUC) GO TO READ-JB.
               MOVE 1 TO INDX1.
               MOVE NSWUC TO INDX3.
           CONT-JB-BINARY-SEARCH.
               SUBTRACT INDX1 FROM INDX3 GIVING BIN-DIFF.
               IF BIN-DIFF = 1 GO TO TEST-JB-TWO-CODES.
               ADD INDX3    INDX1 GIVING INDX2.
               ADD 1 TO INDX2.
               DIVIDE 2 INTO INDX2.
               IF JB-WU-CODE IS LESS THAN SWUC (INDX2) MOVE INDX2 TO INDX3
                                          GO TO CONT-JB-BINARY-SEARCH.
               MOVE INDX2 TO INDX1.
               GO TO CONT-JB-BINARY-SEARCH.
           TEST-JB-TWO-CODES.
               IF JB-WU-CODE = SWUC (INDX1) MOVE INDX1 TO IJ.
               IF JB-WU-CODE = SWUC (INDX3) MOVE INDX3 TO IJ.
               IF IJ = ZERO GO TO READ-JB.
               MOVE 1 TO MATRIX-NUM-KEY.
               READ MATRIX-FILE INVALID KEY GO TO READ-JB.
               IF MATRIX-VAL (IJ) = ZERO GO TO READ-JB.
               MOVE BUNOKEY TO BUREAU-NUMBER-NC.
               MOVE JB-JCN TO JCN-NC.
               WRITE NC-RECORD INVALID KEY NEXT SENTENCE.
               ADD 1 TO PNCACT (IJ).
               ADD JB-MMH-LEVEL1 TO PNCMMH (IJ).
               ADD JB-NORMU-TIME TO PNCMU (IJ).
               ADD JB-NORS-TIME TO PNCS (IJ).
               ADD JB-AWM-TIME TO PNCAWM (IJ).
               IF JB-ATC-LEVEL1 = 'R' ADD JB-MMH-LEVEL2 TO PNCMMH (IJ).
               IF JB-ATC-LEVEL2 IS GREATER THAN '0' AND LESS THAN '9'
                   ADD 1 TO PNCOPT (IJ).
               IF JB-ATC-LEVEL2 = '9' ADD 1 TO PNCATT (IJ).
               GO TO READ-JB.


           END-JOB.
               CLOSE JBW-FILE
                     JB-FILE
                     PRINT-FILE
                     MATRIX-FILE
                     INPUT-CARD-FILE1.
               STOP RUN.

           COST-RTN.
               MOVE ZERO TO J.
               MOVE SWUC (1) TO PREV-4DIGIT-WUC
               MOVE 1 TO K.
           INCR-J-COST.
               ADD 1 TO J.
               IF J IS GREATER THAN NSWUC GO TO COST-RTN-END.
               MOVE SWUC (J) TO WUC-4DIGIT.
               IF WUC-4DIGIT NOT = PREV-4DIGIT-WUC
                                    MOVE SWUC (J) TO PREV-4DIGIT-WUC
                                    ADD 1 TO K.
               MULTIPLY 0.1 BY RMMH (J) ROUNDED.
               MULTIPLY RMMH (J) BY LCOST (K) GIVING RLCOST (J).
               MULTIPLY RACT (J) BY MCOST (K) GIVING RMCOST (J).
               MULTIPLY 0.1 BY PCMMH (J) ROUNDED.
               MULTIPLY PCMMH (J) BY LCOST (K) GIVING PCLCST (J).
               MULTIPLY PCACT (J) BY MCOST (K) GIVING PCMCST (J).
               MULTIPLY 0.1 BY NCMMH (J) ROUNDED.
               MULTIPLY NCMMH (J) BY LCOST (K) GIVING NCLCST (J).
               MULTIPLY NCACT (J) BY MCOST (K) GIVING NCMCST (J).
               MULTIPLY 0.1 BY PNCMMH (J) ROUNDED.
               MULTIPLY PNCMMH  (J)  BY LCOST (K) GIVING PNCLCST (J).
               MULTIPLY PNCACT  (J)  BY MCOST (K) GIVING PNCMCST (J).
               MULTIPLY PCDPOT  (J)  BY DLCOST  (K)  GIVING  PCDEPLCST  (J).
               MULTIPLY PCDPOT  (J)  BY DMCOST  (K)  GIVING  PCDEPMCST  (J).
               MULTIPLY PCDPOT  (J)  BY DTCOST  (K)  GIVING  PCDEPTCST  (J).
               MULTIPLY PCATRT  (J)  BY ATCOST  (K)  GIVING  PCATRTCST  (J).
               MULTIPLY NCDPOT  (J)  BY DLCOST  (K)  GIVING  NCDEPLCST  (J).
               MULTIPLY NCDPOT  (J)  BY DMCOST  (K)  GIVING  NCDEPMCST  (J).
               MULTIPLY NCDPOT  (J)  BY DTCOST  (K)  GIVING  NCDEPTCST  (J).
               MULTIPLY NCATRT  (J)  BY ATCOST  (K)  GIVING  NCATRTCST  (J).
               MULTIPLY RDEPOT  (J)  BY DLCOST  (K)  GIVING  RDEPLCST (J).
               MULTIPLY RDEPOT  (J)  BY DMCOST  (K)  GIVING  RDEPMCST (J).
               MULTIPLY RDEPOT  (J)  BY DTCOST  (K)  GIVING  RDEPTCST (J).
               MULTIPLY RATTRIT (J) BY ATCOST (K) GIVING RATRTCST (J).
               MULTIPLY PNCOPT  (J)  BY DLCOST  (K)  GIVING  PNCDEPLCST  (J).
               MULTIPLY PNCOPT  (J)  BY DMCOST  (K)  GIVING  PNCDEPMCST  (J).
               MULTIPLY PNCOPT  (J)  BY DTCOST  (K)  GIVING  PNCDEPTCST  (J).
               MULTIPLY PNCATT  (J)  BY ATCOST  (K)  GIVING  PNCATRTCST  (J).
               GO TO INCR-J-COST.
           COST-RTN-END.
               EXIT.




           ERR-RTN.
               WRITE PRINT-RECORD FROM ERR-MSG (ERR-IDX) AFTER POSITIONING
                                                                  2 LINES.
           ERR-RTN-END.
               EXIT.
```

```
BUFFER-MOVE.
    MOVE JBW-MMH-LEVEL1 TO BUFMMH (COUNT).
    MOVE JBW-NORMU-TIME TO BUFMU (COUNT).
    MOVE JBW-NORS-TIME TO BUFS (COUNT).
    MOVE JBW-AWM-TIME TO BUFAWM (COUNT).
    IF JBW-ATC-LEVEL1 = 'R' ADD JBW-MMH-LEVEL2 TO BUFMMH (COUNT).
    MOVE IJ TO JBUFFR (COUNT).
    MOVE JBW-MLI-DATE TO MLIDTE (COUNT).
    MOVE JBW-JCN TO JCNO (COUNT).
    MOVE 'N' TO JCNO-TAG (COUNT).
    MOVE ZERO TO DEPBUF (COUNT).
    IF JBW-ATC-LEVEL2 IS GREATER THAN '0' AND LESS THAN '9'
        MOVE 1 TO DEPBUF (COUNT).
    MOVE ZERO TO ATTBUF (COUNT).
    IF JBW-ATC-LEVEL2 = '9' MOVE 1 TO ATTBUF (COUNT).
BUFFER-END.
    EXIT.

SEARCH-PC-LIST.
    MOVE 'N' TO PC-SWT.
    MOVE JBW-BUREAU-NUMBER TO PC-NOM-BN.
    MOVE JBW-JCN TO PC-NOM-JCN.
    READ PC-LIST-FILE INVALID KEY GO TO SEARCH-PC-END.
    MOVE 'Y' TO PC-SWT.
SEARCH-PC-END.
    EXIT.

SEARCH-NC-LIST.
    MOVE 'N' TO NC-SWT.
    MOVE JBW-BUREAU-NUMBER TO NC-NOM-BN.
    MOVE JBW-JCN TO NC-NOM-JCN.
    READ NC-LIST-FILE INVALID KEY GO TO SEARCH-NC-END.
    MOVE 'Y' TO NC-SWT.
SEARCH-NC-END.
    EXIT.

SEARCH-PC-JB.
    MOVE 'N' TO PC-SWT.
    MOVE JB-BUREAU-NUMBER TO PC-NOM-BN.
    MOVE JB-JCN TO PC-NOM-JCN.
    READ PC-LIST-FILE INVALID KEY GO TO SEARCH-PC-JB-END.
    MOVE 'Y' TO PC-SWT.
SEARCH-PC-JB-END.
    EXIT.

SEARCH-NC-JB.
    MOVE 'N' TO NC-SWT.
    MOVE JB-BUREAU-NUMBER TO NC-NOM-BN.
    MOVE JB-JCN TO NC-NOM-JCN.
    READ NC-LIST-FILE INVALID KEY GO TO SEARCH-NC-JB-END.
    MOVE 'Y' TO NC-SWT.
SEARCH-NC-JB-END.
    EXIT.
DATE-DIFF-RTN.
    SUBTRACT SUB-BUFFER-DATE1 FROM SUB-BUFFER-DATE2
                                   GIVING DATE-DIFF.
    SUBTRACT BUFFER-DATE1-YR FROM BUFFER-DATE2-YR
                                  GIVING YR-DIFF.
    IF YR-DIFF IS NOT GREATER THAN ZERO
                                   GO TO DATE-DIFF-END.
    DIVIDE BUFFER-DATE1-YR BY 4
                               GIVING INTEGER-YR.
    MULTIPLY 4 BY INTEGER-YR.
    IF INTEGER-YR = BUFFER-DATE1-YR
                          SUBTRACT 634 FROM DATE-DIFF
                          ELSE SUBTRACT 635 FROM DATE-DIFF.
DATE-DIFF-END.
    EXIT.

PRINT-RTN.
    PERFORM COST-RTN THRU COST-RTN-END.
    PERFORM ZERO-TOTAL-TABLE THRU ZERO-END.
    MOVE ZERO TO J.
HEADING-1-RTN.
    WRITE PRINT-RECORD FROM HEADING-1 AFTER POSITIONING 0 LINES.
    WRITE PRINT-RECORD FROM HEADING-5 AFTER POSITIONING 2 LINES.
    WRITE PRINT-RECORD FROM HEADING-6 AFTER POSITIONING 1 LINES.
    WRITE PRINT-RECORD FROM HEADING-7 AFTER POSITIONING 1 LINES.
    MOVE 6 TO LINE-COUNT.
PRINT1-INCR-J.
    ADD 1 TO J.
    IF J IS GREATER THAN NSWUC PERFORM PRINT-TOTALS THRU
                                   TOTALS-END
                               PERFORM ZERO-TOTAL-TABLE THRU
                                       ZERO-END
                 GO TO HEADING-2-RTN.
    MOVE SWUC (J) TO D-WUC.
    MOVE RACT (J) TO D-ACT.
    ADD RACT (J) TO TOT-ACT.
    MOVE RMMH (J) TO D-MMH.
    ADD RMMH (J) TO TOT-MMH.
    MULTIPLY 0.1 BY RMU (J) ROUNDED.
    MOVE RMU (J) TO D-NORMU.
    ADD RMU (J) TO TOT-NORMU.
    MULTIPLY 0.1 BY RS (J) ROUNDED.
    MOVE RS (J) TO D-NORS.
    ADD RS (J) TO TOT-NORS.
    MULTIPLY 0.1 BY RAWM (J) ROUNDED.
    MOVE RAWM (J) TO D-AWM.
    ADD RAWM (J) TO TOT-AWM.
    MOVE RLCOST (J) TO D-LABOR.
    ADD RLCOST (J) TO TOT-LABOR.
    MOVE RMCOST (J) TO D-MAT.
    ADD RMCOST (J) TO TOT-MAT.
    MOVE RDEPLCST (J) TO D-DLABOR.
    ADD RDEPLCST (J) TO TOT-DLABOR.
    MOVE RDEPMCST (J) TO D-DMAT.
    ADD RDEPMCST (J) TO TOT-DMAT.
    MOVE RDEPTCST (J) TO D-DTRANS.
    ADD RDEPTCST (J) TO TOT-DTRANS.
    MOVE RAIRTCST (J) TO D-DDISC.
    ADD RAIRTCST (J) TO TOT-DDISC.
    WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                              2 LINES.
    ADD 2 TO LINE-COUNT.
    IF LINE-COUNT IS GREATER THAN 56 PERFORM HEADING-1-RTN.
    GO TO PRINT1-INCR-J.
HEADING-2-RTN.
    WRITE PRINT-RECORD FROM HEADING-2 AFTER POSITIONING 0 LINES.
    WRITE PRINT-RECORD FROM HEADING-5 AFTER POSITIONING 2 LINES.
    WRITE PRINT-RECORD FROM HEADING-6 AFTER POSITIONING 1 LINES.
    WRITE PRINT-RECORD FROM HEADING-7 AFTER POSITIONING 1 LINES.
    MOVE 6 TO LINE-COUNT.
PRINT2-INCR-J.
    ADD 1 TO J.
    IF J IS GREATER THAN NSWUC PERFORM PRINT-TOTALS THRU
                                       TOTALS-END
                             PERFORM ZERO-TOTAL-TABLE THRU
                                     ZERO-END
                 GO TO HEADING-3-RTN.
    MOVE SWUC (J) TO D-WUC.
    MOVE PCACT (J) TO D-ACT.
    ADD PCACT (J) TO TOT-ACT.
    MOVE PCMMH (J) TO D-MMH.
    ADD PCMMH (J) TO TOT-MMH.
    MULTIPLY 0.1 BY PCMU (J) ROUNDED.
    MOVE PCMU (J) TO D-NORMU.
    ADD PCMU (J) TO TOT-NORMU.
    MULTIPLY 0.1 BY PCS (J) ROUNDED.
    MOVE PCS (J) TO D-NORS.
    ADD PCS (J) TO TOT-NORS.
    MULTIPLY 0.1 BY PCAWM (J) ROUNDED.
    MOVE PCAWM (J) TO D-AWM.
    ADD PCAWM (J) TO TOT-AWM.
    MOVE PCLCST (J) TO D-LABOR.
    ADD PCLCST (J) TO TOT-LABOR.
    MOVE PCMCST (J) TO D-MAT.
    ADD PCMCST (J) TO TOT-MAT.
    MOVE PCDEPLCST (J) TO D-DLABOR.
    ADD PCDEPLCST (J) TO TOT-DLABOR.
    MOVE PCDEPMCST (J) TO D-DMAT.
    ADD PCDEPMCST (J) TO TOT-DMAT.
    MOVE PCDEPTCST (J) TO D-DTRANS.
    ADD PCDEPTCST (J) TO TOT-DTRANS.
    MOVE PCATRTCST (J) TO D-DDISC.
    ADD PCATRTCST (J) TO TOT-DDISC.
    WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                          2 LINES.
    IF LINE-COUNT IS GREATER THAN 56 PERFORM HEADING-2-RTN.
    ADD 2 TO LINE-COUNT.
    GO TO PRINT2-INCR-J.
HEADING-3-RTN.
    WRITE PRINT-RECORD FROM HEADING-3 AFTER POSITIONING 0 LINES.
    WRITE PRINT-RECORD FROM HEADING-5 AFTER POSITIONING 2 LINES.
    WRITE PRINT-RECORD FROM HEADING-6 AFTER POSITIONING 1 LINES.
    WRITE PRINT-RECORD FROM HEADING-7 AFTER POSITIONING 1 LINES.
    MOVE 6 TO LINE-COUNT.
PRINT3-INCR-J.
    ADD 1 TO J.
    IF J IS GREATER THAN NSWUC PERFORM PRINT-TOTALS THRU
                                             TOTALS-END
                             PERFORM ZERO-TOTAL-TABLE THRU
                                     ZERO-END
                 GO TO HEADING-4-RTN.
    MOVE SWUC (J) TO D-WUC.
    MOVE NCACT (J) TO D-ACT.
    ADD NCACT (J) TO TOT-ACT.
    MOVE NCMMH (J) TO D-MMH.
    ADD NCMMH (J) TO TOT-MMH.
    MULTIPLY 0.1 BY NCMU (J) ROUNDED.
    MOVE NCMU (J) TO D-NORMU.
    ADD NCMU (J) TO TOT-NORMU.
    MULTIPLY 0.1 BY NCS (J) ROUNDED.
    MOVE NCS (J) TO D-NORS.
    ADD NCS (J) TO TOT-NOPS.
    MULTIPLY 0.1 BY NCAWM (J) ROUNDED.
    MOVE NCAWM (J) TO D-AWM.
    ADD NCAWM (J) TO TOT-AWM.
    MOVE NCLCST (J) TO D-LABOR.
    ADD NCLCST (J) TO TOT-LABOR.
    MOVE NCMCST (J) TO D-MAT.
    ADD NCMCST (J) TO TOT-MAT.
    MOVE NCDEPLCST (J) TO D-DLABOR.
    ADD NCDEPLCST (J) TO TOT-DLABOR.
    MOVE NCDEPMCST (J) TO D-DMAT.
    ADD NCDEPMCST (J) TO TOT-DMAT.
    MOVE NCDEPTCST (J) TO D-DTRANS.
    ADD NCDEPTCST (J) TO TOT-DTRANS.
    MOVE NCATRTCST (J) TO D-DDISC.
    ADD NCATRTCST (J) TO TOT-DDISC.
    WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                          2 LINES.
    IF LINE-COUNT IS GREATER THAN 56 PERFORM HEADING-3-RTN.
    ADD 2 TO LINE-COUNT.
    GO TO PRINT3-INCR-J.
HEADING-4-RTN.
    WRITE PRINT-RECORD FROM HEADING-4 AFTER POSITIONING 0 LINES.
    WRITE PRINT-RECORD FROM HEADING-5 AFTER POSITIONING 2 LINES.
    WRITE PRINT-RECORD FROM HEADING-6 AFTER POSITIONING 1 LINES.
    WRITE PRINT-RECORD FROM HEADING-7 AFTER POSITIONING 1 LINES.
    MOVE 6 TO LINE-COUNT.
PRINT4-INCR-J.
    ADD 1 TO J.
    IF J IS GREATER THAN NSWUC PERFORM PRINT-TOTALS THRU
                                     TOTALS-END
                 GO TO PRINT-RTN-END.
    MOVE SWUC (J) TO D-WUC.
    MOVE PNCACT (J) TO D-ACT.
    ADD PNCACT (J) TO TOT-ACT.
    MOVE PNCMMH (J) TO D-MMH.
    ADD PNCMMH (J) TO TOT-MMH.
    MULTIPLY 0.1 BY PNCMU (J) ROUNDED.
    MOVE PNCMU (J) TO D-NORMU.
    ADD PNCMU (J) TO TOT-NORMU.
    MULTIPLY 0.1 BY PNCS (J) ROUNDED.
    MOVE PNCS (J) TO D-NORS.
    ADD PNCS (J) TO TOT-NORS.
    MULTIPLY 0.1 BY PNCAWM (J) ROUNDED.
    MOVE PNCAWM (J) TO D-AWM.
    ADD PNCAWM (J) TO TOT-AWM.
    MOVE PNCLCST (J) TO D-LABOR.
```

```
               ADD PNCLCST (J) TO TOT-LABOR.
               MOVE PNCMCST (J) TO D-MAT.
               ADD PNCMCST (J) TO TOT-MAT.
               MOVE PNCDEPLCST (J) TO D-DLABOR.
               ADD PNCDEPLCST (J) TO TOT-DLABOR.
               MOVE PNCDEPMCST (J) TO D-DMAT.
               ADD PNCDEPMCST (J) TO TOT-DMAT.
               MOVE PNCDEPTCST (J) TO D-DTRANS.
               ADD PNCDEPTCST (J) TO TOT-DTRANS.
               MOVE PNCATRTCST (J) TO D-DDISC.
               ADD PNCATRTCST (J) TO TOT-DDISC.
               WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                                         2 LINES.
               IF LINE-COUNT IS GREATER THAN 56 PERFORM HEADING-4-RTN.
               ADD 2 TO LINE-COUNT.
               GO TO PRINT4-INCR-J.
           PRINT-RTN-END.
               EXIT.
 ***
           PRINT-TOTALS.
               MOVE 'TOTAL' TO D-WUC.
               MOVE TOT-ACT TO D-ACT.
               MOVE TOT-MMH TO D-MMH.
               MOVE TOT-NORMU TO D-NORMU.
               MOVE TOT-NORS TO D-NORS.
               MOVE TOT-AWM TO D-AWM.
               MOVE TOT-LABOR TO D-LABOR.
               MOVE TOT-MAT TO D-MAT.
               MOVE TOT-DLABOR TO D-DLABOR.
               MOVE TOT-DMAT TO D-DMAT.
               MOVE TOT-DTRANS TO D-DTRANS.
               MOVE TOT-DDISC TO D-DDISC.
               WRITE PRINT-RECORD FROM DETAIL-LINE AFTER POSITIONING
                                                         2 LINES.
               MOVE ZERO TO J.
               MOVE ZERO TO TOTAL-TABLE.
           TOTALS-END.
               EXIT.
 ***
           ZERO-TOTAL-TABLE.
               MOVE ZERO TO TOT-ACT, TOT-MMH, TOT-NORMU, TOT-NORS,
                            TOT-AWM, TOT-LABOR, TOT-MAT, TOT-DLABOR,
                            TOT-DMAT, TOT-DTRANS, TOT-DDISC.
           ZERO-END.
               EXIT.
           CHECK-POINT.
               MOVE J TO SAVE-J.
               MOVE 1 TO J.
               OPEN OUTPUT RESTART-FILE.
           CHECK-PT-BEGIN.
               MOVE PCDPOT (J) TO PCDPOT-O.
               MOVE PNCDPT (J) TO PNCDPT-O.
               MOVE RDEPOT (J) TO RDEPOT-O.
               MOVE NCDPOT (J) TO NCDPOT-O.
               MOVE PCATRT (J) TO PCATRT-O.
               MOVE PNCATT (J) TO PNCATT-O.
               MOVE RATTRIT (J) TO RATTRIT-O.
               MOVE NCATRT (J) TO NCATRT-O.
               MOVE PCACT (J) TO PCACT-O.
               MOVE PCMMH (J) TO PCMMH-O.
               MOVE PCMU (J) TO PCMU-O.
               MOVE PCS (J) TO PCS-O.
               MOVE PCAWM (J) TO PCAWM-O.
               MOVE PNCACT (J) TO PNCACT-O.
               MOVE PNCMMH (J) TO PNCMMH-O.
               MOVE PNCMU (J) TO PNCMU-O.
               MOVE PNCS (J) TO PNCS-O.
               MOVE PNCAWM (J) TO PNCAWM-O.
               MOVE NCACT (J) TO NCACT-O.
               MOVE NCMMH (J) TO NCMMH-O.
               MOVE NCMU (J) TO NCMU-O.
               MOVE NCS (J) TO NCS-O.
               MOVE NCAWM (J) TO NCAWM-O.
               MOVE RACT (J) TO RACT-O.
               MOVE RMMH (J) TO RMMH-O.
               MOVE RMU (J) TO RMU-O.
               MOVE RS (J) TO RS-O.
           MOVE RAWM (J) TO RAWM-O.
           WRITE RESTART-RECORD INVALID KEY NEXT SENTENCE.
           ADD 1 TO J.
           IF J IS GREATER THAN NSWUC GO TO CHECK-PT-J.
           GO TO CHECK-PT-BEGIN.
       CHECK-PT-J.
           MOVE SAVE-J TO  PCACT-O.
           WRITE RESTART-RECORD INVALID KEY NEXT SENTENCE.
           CLOSE RESTART-FILE.
       CHECK-POINT-END.
           EXIT.
       RESTART.
           OPEN INPUT RESTART-FILE.
           MOVE 1 TO J.
       RESTART-INCR-J.
           READ RESTART-FILE AT END
               DISPLAY 'BAD END OF FILE AT RESTART FILE' UPON CONSOLE
                   GO TO RESTART-READ-END.
           MOVE PCDPOT-O TO PCDPOT (J).
           MOVE PNCDPT-O TO PNCDPT (J).
           MOVE RDEPOT-O TO RDEPOT (J).
           MOVE NCDPOT-O TO NCDPOT (J).
           MOVE PCATRT-O TO PCATRT (J).
           MOVE PNCATT-O TO PNCATT (J).
           MOVE RATTRIT-O TO RATTRIT (J).
           MOVE NCATRT-O TO NCATRT (J).
           MOVE PCACT-O TO PCACT (J).
           MOVE PCMMH-O TO PCMMH (J).
           MOVE PCMU-O TO PCMU (J).
           MOVE PCS-O TO PCS (J).
           MOVE PCAWM-O TO PCAWM (J).
           MOVE PNCACT-O TO PNCACT (J).
           MOVE PNCMMH-O TO PNCMMH (J).
           MOVE PNCMU-O TO PNCMU (J).
           MOVE PNCS-O TO PNCS (J).
           MOVE PNCAWM-O TO PNCAWM (J).
           MOVE NCACT-O TO NCACT (J).
           MOVE NCMMH-O TO NCMMH (J).
           MOVE NCMU-O TO NCMU (J).
           MOVE NCS-O TO NCS (J).
           MOVE NCAWM-O TO NCAWM (J).
           MOVE RACT-O TO RACT (J).
           MOVE RMMH-O TO RMMH (J).
           MOVE RMU-O TO RMU (J).
           MOVE RS-O TO RS (J).
           MOVE RAWM-O TO RAWM (J).
           ADD 1 TO J.
           IF J IS GREATER THAN NSWUC GO TO RESTART-J.
           GO TO RESTART-INCR-J.
       RESTART-J.
           READ RESTART-FILE AT END
               DISPLAY 'BAD END OF FILE AT RESTART FILE' UPON CONSOLE
                   GO TO RESTART-READ-END.
           MOVE PCACT-O TO J.
           SUBTRACT 1 FROM J.
       RESTART-READ-END.
           CLOSE RESTART-FILE.
       RESTART-END.
           EXIT.
       REORG-FILES.
           CLOSE NC-LIST-FILE PC-LIST-FILE.
           OPEN INPUT KEYLIST-INP1 OUTPUT IN-TAP1.
           MOVE LOW-VALUES TO NC-NOM-KEY PC-NOM-KEY.
           MOVE LOW-VALUE TO NOMKEY1, NOMKEY2.
       READ-KEYFILE1.
           READ KEYLIST-INP1
                   AT END CLOSE KEYLIST-INP1 IN-TAP1
                           GO TO RECREATE-KEY1.
           WRITE IN-REC1 FROM KEYLIST-REC1.
                 GO TO READ-KEYFILE1.
       RECREATE-KEY1.
           OPEN INPUT IN-TAP1.
           OPEN OUTPUT KEYLIST-OUT1.
       READ-TAPE1.
           READ IN-TAP1 INTO KEYLIST-KEY3
                 AT END CLOSE KEYLIST-OUT1
                        CLOSE IN-TAP1
```

```
01848                                 GO TO KEYFILE2-SAVE.
01849                WRITE KEYLIST-REC3 INVALID KEY
01850                      DISPLAY 'INVALID WRITE ON KEYLIST1-FILE = '
01851                               KEYLIST-KEY3 UPON SYSLST.
01852                        GO TO READ-TAPE1.
01853            KEYFILE2-SAVE.
01854                OPEN INPUT KEYLIST-INP2 OUTPUT IN-TAP1.
01855            READ-KEYFILE2.
01856                READ KEYLIST-INP2
01857                          AT END CLOSE KEYLIST-INP2 IN-TAP1
01858                               GO TO RECREATE-KEY2.
01859                WRITE IN-REC1 FROM KEYLIST-REC2.
01860                        GO TO READ-KEYFILE2.
01861            RECREATE-KEY2.
01862                OPEN INPUT IN-TAP1.
01863                OPEN OUTPUT KEYLIST-OUT2.
01864            READ-TAPE2.
01865                READ IN-TAP1 INTO KEYLIST-KEY4
01866                        AT END CLOSE KEYLIST-OUT2 IN-TAP1
01867                               GO TO REORG-EXIT.
01868                WRITE KEYLIST-REC4 INVALID KEY
01869                      DISPLAY 'INVALID WRITE ON KEYLIST2-FILE = '
01870                               KEYLIST-KEY4 UPON SYSLST.
01871                        GO TO READ-TAPE2.
01872            REORG-EXIT.
01873                MOVE SAVE-J TO J.
01874                MOVE ZEROS TO CHECK-PT-REC-COUNT.
01875                OPEN I-O NC-LIST-FILE PC-LIST-FILE.
```